

COMMERCIAL AIR TRANSPORTATION

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PREFACE

COMMERCIAL AIR TRANSPORTATION in the United States has arrived at its present state of development within a comparatively short period of time. Its development before World War II was so sudden that the public was hardly able to keep pace with it, or even to understand it, or to accept it fully as another means of getting from one place to another. During the war years, however, air transportation came into its own, and aeronautical progress took place at an unprecedented rate, so that at the close of hostilities we found ourselves probably fifty years further ahead in air transport techniques, in aeronautical knowledge, in the development of flying equipment and devices which could be adapted to commercial use, and in public acceptance of this new means of getting about the world than we would have been if the conflict had not taken place. This development has continued at a somewhat less rapid pace since the close of the war, and the future of commercial air transportation holds tremendous opportunities for expansion.

The American people, who can better afford air travel and air shipping than any other people in the world, have begun to use this means of transportation in large numbers; but the mass market for air travel and air shipping has barely been scratched. Because of time-saving speed, commercial air transportation has become invaluable from the standpoint of business, pleasure, and national defense. It is a young industry; yet it has made more rapid progress than has ever been made in the same period of time by any other agency of transportation. This, perhaps, is one reason why the literature on the business aspects of aviation has been somewhat limited.

The first edition of this book was published in January, 1942, in response to a demand from shippers and travelers by air, men and women in the air transportation industry or about to enter it, and students and teachers of transportation who felt the lack of study and teaching material on the commercial or business development side of this industry. Its purpose was to bring material together from many scattered sources and to analyze and interpret it so as to overcome this lack. A revised edition was published in 1946, when, with the close of hostilities, it seemed a fitting time again to examine the various aspects of commercial air transportation in order to take notice of many

war-engendered developments and to bring the entire subject up to date. The third edition, published in 1951, was essentially a new book since earlier editions were entirely rewritten because of the many things influencing aeronautical development which took place after World War II. This fourth edition seeks to key all discussions to the present times. The commercial air transportation industry has made such strides; public interest in aviation has increased to such an extent; new uses for air transport have developed so rapidly; and the airlines have been faced with so many new problems that it is necessary to again present a picture of the more recent developments. Policies and regulations in this rapidly growing industry have now become somewhat solidified, so that they may be examined and certain predictions made as to future developments.

Since the appearance of the first edition, the author has been in constant contact with many people interested in developing air transportation, with various governmental regulatory agencies, and with numerous airlines, in a consulting or other capacity. Much of the firsthand information on various airline and regulatory problems thus gained is incorporated into this volume. It would, however, have been impossible to bring this material to the reader in its present form had it not been for the co-operation of many men and women in the air transportation industry, some of them former students, who have given unstintingly of their time in interviews and correspondence on various topics. It is impossible to mention each of these individually, but the author does want to express his appreciation to the airlines and others who so generously supplied illustrations. He also wishes to thank his fellow teachers who have made constructive suggestions to make this a more useful book for their purposes. Among these, special appreciation is due to Professor Harold S. Wood of Parks College of Aeronautical Technology, Saint Louis University.

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Chapter

1 * TRANSPORT AIRCRAFT

IN ORDER to understand the steps, both technological and economic, by which air transportation has reached its present position of importance, it is necessary to review the historical development of flight.

Experiments with Lighter-than-Air Machines

Disregarding the crude attempts at human flight recorded in the early legends, histories, and literature of various peoples, the first successful experiment in air transportation took place on June 5, 1783. This was the earliest recorded modern balloon ascension, the result of experiments by the brothers Joseph and Etienne Montgolfier of France. The balloon was constructed of paper with a capacity of about 700 cubic feet. Filled with smoke and heated air, it rose to the height of 6,000 feet and traveled horizontally approximately 7,500 feet before it lost its buoyancy and sank to the ground. On November 21 of the same year, the first human ascent was made—man's first aerial voyage—when Jean-Francois Pilatre de Rozier and the Marquis D'Arlandes stayed aloft 23 minutes in a Montgolfier balloon.¹

With a lifting element available, the problem now was to develop a thoroughly airtight fabric. This was important since it was becoming apparent that hydrogen would be a much more efficient lifting agent than the hot air and smoke "gas" of the Montgolfier brothers. Happily, just when the French Chemist J. A. C. Charles was experimenting with hydrogen, two brothers, A. J. and M. N. Robert discovered that it was possible to apply a coating of dissolved rubber to silk fabric and thereby secure an airtight covering. On August 20, 1783, such a balloon was filled with hydrogen and liberated. It rose to "a very great height, but because of too strong inflation it ruptured and the envelope fell to the ground."² In December, 1783, the chemist J. A. C. Charles, accompanied by one of the Roberts brothers, made

¹ S. Paul Johnston, *Horizons Unlimited* (New York: Duell, Sloan and Pearce, 1941), pp. 38-41.

² *The Encyclopedia Americana*, Vol. 1, 1940, p. 180.

an ascent from Paris which demonstrated the advantage of the hydrogen over the hot-air balloon; their flight lasted an hour and three-quarters, and they traveled some 27 miles from the starting point.³

These flights greatly stimulated public and scientific interest in ballooning and aeronautics throughout Europe and particularly in France, where great rivalry sprang up between the Montgolfier and Charles, or "the heated air and the hydrogen, schools of ballooning."⁴ Interest was also aroused in England, and in 1785 Jean Pierre Blanchard, a French aeronaut, and Dr. John Jeffries, a Boston physician who financed the project, made the first balloon flight across the English channel from Dover to a point near Calais. This trip is said to have carried the first air mail anywhere in the world.⁵

The first authenticated balloon ascent in America apparently was made at Baltimore in 1784, by Peter Carnes, who built a Montgolfier-type balloon. Before ascending, however, Carnes had a 13-year-old boy, Edward Warren, embark as a volunteer on a solo trip, so that it seems possible Warren was the first American to ascend into the air over this country.⁶ A few years later, on January 9, 1793, Jean Pierre Blanchard began the first air voyage in America. Starting from Philadelphia in the presence of President George Washington and a large number of local citizens, Blanchard ascended in a hydrogen balloon, carrying a passport of introduction from Washington, which has since been considered the first air-borne letter in this country. The balloon reached a maximum altitude of 5,812 feet, traveled 15 miles in 46 minutes, and landed in the woods a little to the eastward of Woodbury, New Jersey.⁷

The first balloon constructed on anything like modern proportions was *The Great Balloon of Nassau* which, on its first ascension in 1836, was navigated from London to Weilburg, a distance of 500 miles. This balloon continued in active service for a total of some 35 years, figuring in many notable aeronautical events, "a record that has never been exceeded by any flying machine since."⁸

Balloons were looked upon by many in the eighteenth and early nineteenth centuries as instruments of air navigation with almost lim-

³ S. Paul Johnston, *op. cit.*, p. 41.

⁴ G. Lloyd Wilson and Leslie A. Bryan, *Air Transportation* (New York: Prentice-Hall, Inc., 1949), p. 8.

⁵ *Ibid.*, p. 9.

⁶ G. Lloyd Wilson and Leslie A. Bryan, *op. cit.*, p. 9.

⁷ Carroll Frey, *The First Air Voyage in America* (Philadelphia: The Penn Mutual Life Insurance Co., 1933), p. 4.

⁸ S. Paul Johnston, *op. cit.*, pp. 48-49.

itless possibilities, but enthusiasts soon discovered that a craft depending solely upon the winds for its direction of flight was of no practical use in commerce. Balloons continued to be used, however, in limited ways for scientific investigation or upper air research, as new and adventurous sporting devices, as attractions at fairs and carnivals, and in World War I for observation and reconnaissance work.

The airship or dirigible was the logical technological development to follow the free balloon. This type of lighter-than-air craft contains two features not found in balloons—a rigid or semirigid structure, and motive power to give it maneuverability.⁹ In 1884 Captain Charles Renard of the French War Department produced the first man-carrying airship that ever returned against the wind to its starting point, and “the first aerial vessel whose shape and dynamic adjustment even approximated the requirements of steady and swift navigation in a surrounding medium presenting various conditions of turbulence and calm.”¹⁰ The first gasoline-engine dirigible was built by a German inventor, Dr. Hans Wolfert, in 1896. His engine was about nine horsepower. Later an Austrian inventor, David Schwartz, designed a rigid airship propelled by a benzine engine capable of attaining a speed of 17 miles per hour. The gas bag of this craft was enclosed in a thin casing of aluminum.

The greatest contributions to lighter-than-air construction and navigation were made by Captain (later Count) Ferdinand von Zeppelin. In 1900 he completed a pencil-shaped rigid airship 416 feet long, capable of attaining average speeds of 20 miles per hour. It was, however, not until 1910, after overcoming many difficulties and exhausting his financial resources, that he was able to produce his first passenger-carrying craft. “Zeppelins” as they were called, made numerous raids over England in World War I, thus proving their efficiency as long-range military weapons. In a three-year period (1910–1914) a subsidiary of the Zeppelin Company, Deutsche Luftschiffahrt Aktien-Gesellschaft, carried more than 35,000 passengers in what has been termed the first commercial common-carrier service by air transport.¹¹ In 1924 the United States received one of these German craft, the *Los Angeles*, which was used by the Navy for some eight years before being decommissioned. The *Graf Zeppelin* was flown on a commercial basis across the South Atlantic by the Germans for six years,

⁹ G. Lloyd Wilson and Leslie A. Bryan, *op. cit.*, p. 12.

¹⁰ *The Encyclopedia Americana*, *op. cit.*, p. 180.

¹¹ G. Lloyd Wilson and Leslie A. Bryan, *op. cit.*, p. 81.

completing 75 successful crossings, and in 1936, the *Hindenburg* made ten round trips over the North Atlantic before being destroyed by fire at Lakehurst, New Jersey, on May 6, 1937.

While Count von Zeppelin was constructing rigid-type airships (so-called because the external form is fixed and independent of internal gas pressure), Alberto Santos-Dumont, a Brazilian, fitted a light engine to a balloon of his own design and made successful flights. During the early 1900's Dumont built and flew 14 ships of various non-rigid and semirigid types.

In the United States, starting in 1911, the Goodyear Tire and Rubber Company of Akron, Ohio, became actively engaged in constructing and experimenting with lighter-than-air craft. In 1923 they acquired the North American patent rights of the German Zeppelin builders (Luftschiffbau-Zeppelin) and organized the Goodyear Zeppelin Corporation. This company built two large rigid airships for the Navy; the first, named the *Akron*, was delivered in 1932, and the second, the *Macon*, in 1933. Both these craft were lost in storms within a year or so after completion. The company has been more fortunate, however, with its smaller nonrigid airships, and for many years has maintained a fleet for both passenger-carrying and advertising purposes. The United States Navy has also made extensive use of the nonrigid airship, particularly for reconnaissance purposes off American coasts during World War II.¹²

Early Experiments with Heavier-than-Air Machines

In the eighteenth and nineteenth centuries, while the experiments with lighter-than-air craft were going on, similar efforts were being made with various types of machines heavier than air. The eighteenth century contributed scientific knowledge in the fields of aeronautics and aerodynamics, and progress accelerated in the nineteenth century, particularly after the discovery of steam power revealed the possibility of obtaining force enough to propel heavier-than-air craft. In 1810 Sir George Cayley, an English scientist, published a series of articles on aerial navigation in which he proposed that the surfaces (the wings of the airplane) could be made to support a given weight (the weight of the entire machine) by the application of power to the resistance of air. "All successful airplanes have been constructed according to this principle."¹³ In 1848 another Englishman, John Stringfellow, com-

¹² G. Lloyd Wilson and Leslie A. Bryan, *op. cit.*, p. 85; *The Encyclopedia Americana*, *op. cit.*, p. 181; S. Paul Johnston, *op. cit.*, pp. 73-132; P. W. Litchfield and Hugh Allen, *Why Has America No Rigid Airships?* (Cleveland: Corday and Gross, 1935).

¹³ G. Lloyd Wilson and Leslie A. Bryan, *op. cit.*, p. 16.

pleted a model which was the first power-driven airplane to be flown in free flight. He was not able, however, to construct a full-sized airplane that could be flown successfully. The work of these experimenters was handicapped by the complex problems of aerodynamics and by the inability of inventors to produce engines of low weight per horsepower developed. A number of experiments followed, therefore, with gliders or engineless planes. The success of the gliding experiments carried on between 1889 and 1911—by Otto Lilenthal, a native of Pomerania, Percy S. Pilcher, an Englishman, and John J. Montgomery and Octave Chanute, Americans—developed valuable information “pertaining to the flying qualities of various types of planes and brought about a partial solution of the problems of stability.”¹⁴

The last years of the nineteenth century and the first few years of the twentieth witnessed a race to construct and fly the first heavier-than-air, power-driven, man-carrying machine. Among those who actually built and tried such airplanes were Clement Ader, a French inventor, Sir Hiram Maxim, an Englishman, and Samuel Pierpont Langley, an American. The Ader plane was large enough to carry a man, but could not do more than make short hops along the ground. The Maxim plane, a huge affair for those times, measuring 50 feet across the wings and equipped with two 175-horsepower steam engines, proved a failure. The United States government financed Langley's construction of a tandem monoplane, but this crashed on its first launching. It remained, therefore, for the brothers Wilbur and Orville Wright to achieve finally the first powered flight of a heavier-than-air machine on December 17, 1903, at Kitty Hawk, North Carolina.¹⁵ From this point on, the development of the airplane advanced at a phenomenal pace, with rapid strides being made in engine design, aerodynamics, and structures.

Progress after Kitty Hawk

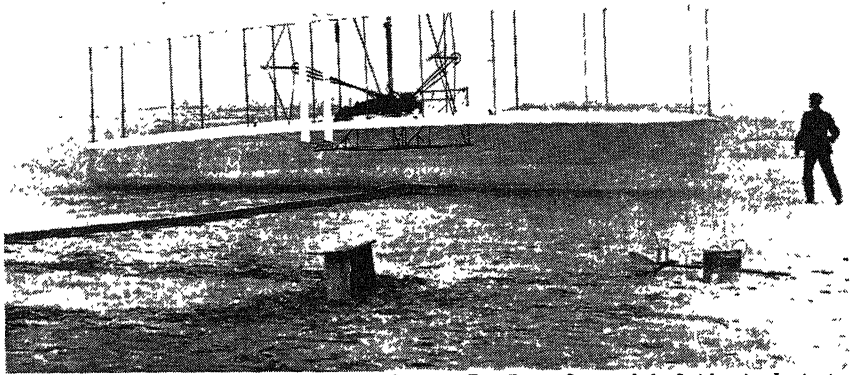
Until about 1922, airplanes were built almost exclusively of wood, which had a high strength-weight ratio and was a natural and easy medium for experimental construction. Dr. Claude Dornier, in Germany, was among the first to apply Duralumin to aircraft. American builders were slow to adopt metal construction, however, and it was not until 1922, when Anthony H. G. Fokker exhibited his welded steel fuselage in the United States, that metal construction became popular in this country. It was soon recognized that metal had the advantages

¹⁴ G. Lloyd Wilson and Leslie A. Bryan, *op. cit.*, pp. 18-20.

¹⁵ Fred C. Kelly, *The Wright Brothers* (New York: Harcourt, Brace & Co., 1943).

of safety, high strength, and durability. Today both transport aircraft and smaller airplanes are made completely of aluminum alloy sheet and extruded sections.

With the advent of metal construction came a new type of structure known as "semimonocoque," which has replaced the early "stick and



Courtesy: Esso Export Corp. and the Smithsonian Institution

FIG. 2. The historic first flight at Kitty Hawk, N.C., on December 17, 1903. Orville Wright is the pilot while Wilbur Wright looks on. On that day four flights were made in all, two by Orville and two by Wilbur. The final one, by Wilbur, lasted for 59 seconds.

wire" construction. In this type of structure there is little framework other than that necessary to keep the shape, the stresses being taken by the skin or covering, reinforced by frames and stringers. The increased knowledge of the resistance of structural members exposed to the wind caused designers to "fair in" all exposed frameworks and eventually to develop cantilever wings, whose internal structure is such as to make them self-supporting without the aid of external bracing.¹⁶

After the Wright brothers demonstrated the practicability of heavier-than-air machines by their flights in 1903, interest in air transportation grew slowly until after 1908. Numerous types of aircraft were constructed and principles of controlled flight developed. At the start of World War I, the potentialities of the airplane as a military instrument became quickly apparent, and enormous building opera-

¹⁶ *The Encyclopedia Americana, op. cit., p. 182.*

tions were undertaken by the belligerent governments and by private manufacturers both in this country and abroad. The development of aviation during the war years brought about improvements in airplane design and construction which otherwise would have taken many years to achieve, and at the same time broadened experience and interest in aviation.¹⁷

Technical Developments

After the close of World War I, transport aircraft progressed rapidly. Small, single-engined biplanes which contained from four to ten wicker chairs, had a cruising speed of 90 miles per hour, and cost less than \$10,000, soon developed into today's large monoplanes of two or four engines—which carry from 40 to 90 passengers plus crew, weigh up to nearly 100 tons gross, and cost from \$700,000 to \$1,600,000 each. The increase in size was gradual, however, and depended on parallel technical developments. Each forward step had to be based on the successful performance of a preceding one, and a successful experimental and design venture was necessary in order to obtain the new working capital for financing expansion in manufacture.

One of the first forward steps in transport aircraft design was the development of the retractable undercarriage, which permitted forced landings on rough fields with less danger of the airplane's nosing over and reduced the possibility of consequent fire. Low wings, which acted to lower the center of gravity, also helped. Another early improvement was the arrangement of the cockpit to suit the pilot's needs. Flying instruments were designed so they could more easily be distinguished from engine instruments, and emergency controls were made more readily accessible. Other safety devices were the controllable pitch propeller and, later, the full-feathering propeller. Systems of light signals were devised to inform pilots whether all parts were functioning satisfactorily; these became more necessary as the number of accessories and instruments increased. Progress was also registered in improving aircraft fuels and providing for their efficient use.

World War II telescoped into the period of a few years aircraft technical developments which normally would have taken ten. Advances ranged from a demonstration that increased wing loadings and

¹⁷ For general discussions of the early history of air transportation, see E. P. Warner, *The Early History of Air Transportation* (Northfield, Vt.: Norwich University, 1938); E. E. Freudenthal, *The Aviation Business* (New York: The Vanguard Press, 1940); H. L. Smith, *Airways* (New York: Alfred A. Knopf, Inc., 1942).

increased landing speeds (resulting from increased gross weights for a particular type of plane) could be satisfactorily accepted when maneuverability and controllability characteristics were good; to the development of vinylite substitutes that were superior to the linoleum and rubber previously used for interior wear surfaces. There was, in fact, no part of the airplane—down to the most minute item of equipment or furnishings—that did not benefit significantly from wartime advances.

The need for ignition systems of greater reliability at high altitudes and under extreme temperature conditions resulted in the improvement of ignition wire, spark plugs, and ignition-shielding conduits. These same factors produced reliable automatic carburetors and brought attention to the fact that fuel systems must be given more engineering consideration. Still further strides were made in such items as centrifugal pumps, integral fuel tanks, and synthetic rubber materials.

There were also important developments in the field of aircraft instruments, many of which have already proved greatly beneficial to commercial operators. Among these were the fully automatic pilot, the gyroscopically stabilized remote indicating magnetic compass, automatic air-position indicators, gyro-stabilized driftmeters, radio altimeters, true airspeed indicators, distance-measuring equipment, lighter and more rugged engine remote indicating instruments of the telemeter type, and improved engine cylinder temperature-measuring equipment.

Various types of automatic control equipment, designed to ease the work of the flight crew, were also developed. These included engine-turbo control, automatic horsepower or single-lever control of aircraft engines, automatic cabin pressurization control, automatic temperature control equipment, and various miscellaneous controls for wing flaps, cowl flaps, and oil-cooler shutters. Instrument lighting in the airplane's control cabin was improved with refinement of fluorescent lighting equipment and the extensive use of red light to avoid glare in night flying.

Aircraft developments during the war also introduced combustion heaters, cabin supercharging, electrically heated food and liquid containers, oxygen systems, light-weight brakes, high-pressure hydraulic systems, hot-air anti-icing equipment, and improved weight and balance control. Substitutes for steel, wood, aluminum, and other materials had a thorough testing under wartime conditions.

An especially important development of this period was that of

practical rotary wing flight in the form of the helicopter.¹⁹ The helicopter is the only aircraft able to gain quick and ready access to any site regardless of terrain, even if the landings are at considerable altitudes. As a commercial vehicle, the helicopter's unique flying abilities have established it as a regular means of performing many functions more quickly and economically than any other medium. The Armed Forces of this country have also used helicopters to provide a degree of mobility not otherwise obtainable. Extensive operations, both military and commercial, have resulted in tremendous technical and operational advances in this type of aircraft in the last few years and have developed a substantial industry in their manufacture.

Changes in Equipment

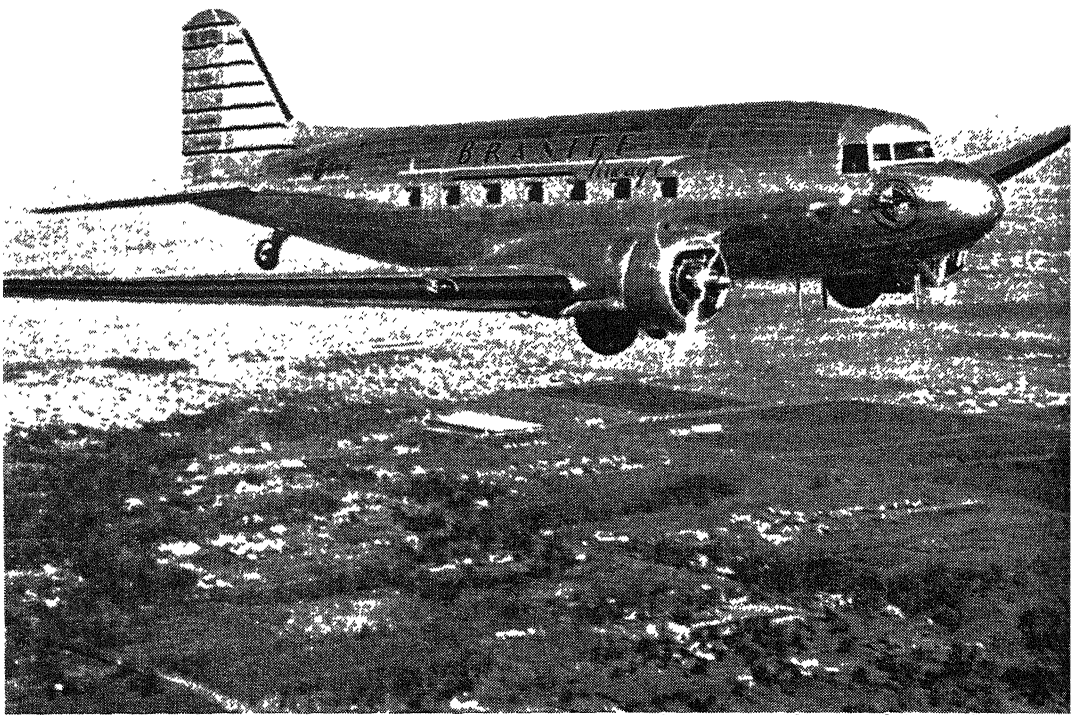
Because of strict maintenance, commercial aircraft never really wear out. They are, however, made obsolete by newer designs which have both higher speed and useful load or are more economical to operate or offer greater passenger comfort. There have been several major changes in air transport equipment during the last 25 years. These are:

1. In 1931 and 1932 the old Ford and Fokker trimotored airplanes were displaced by the 18-passenger B-18 twin-engine Curtiss "Condor"; a year later these slow aircraft were displaced by the faster 15-passenger T-32 twin-engine "Condor."

2. In 1934 and 1935 the twin-engine "Condor" airplanes began to give way to the faster and more comfortable Douglas DC-2, the first twin-engine airplane really to have practical single-engine performance.

3. In 1936 and 1937 most of the airlines began dropping the DC-2 in favor of the Douglas DC-3 (Fig. 3). Even before the outbreak of World War II, the DC-3 was regarded as somewhat obsolete in design, because airplanes of larger size and substantially greater speed were being developed, thus giving lower cost of operation per passenger-seat-mile. The DC-3 was, however, used by nearly all airlines during the war because manufacturers were producing fighter and bomber planes rather than commercial models. During these years there was also one type of four-engine airplane in use, the Boeing 307 (Fig. 4); but by the war's outbreak this had been put into use by only two airlines.

¹⁹ The world's first notably successful helicopter was developed by Igor Sikorsky and flown by him in 1940. Devon Francis, *The Story of the Helicopter* (New York: Coward-McCann, Inc., 1946), p. 3.

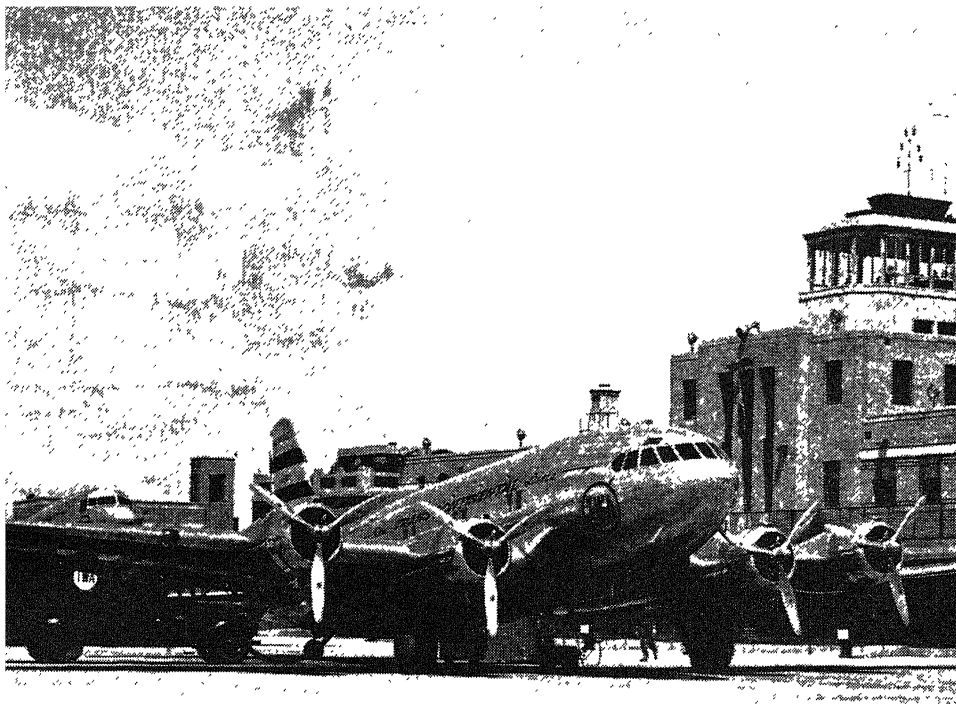


Courtesy: Braniff International Airways, Inc.

FIG. 3. The Douglas Aircraft Co. DC-3. This was the "standard plane" of the airlines until after the close of World War II. Capacity: 21 passengers and a crew of three. Speed: between 150 and 180 miles per hour. It has been called the "workhorse of air transportation" and is still in use by some airlines.

4. In 1945 and 1946, with the ending of World War II, the airlines were able to supplement their DC-3's with a considerable number of DC-4 aircraft obtained from the armed services and converted for commercial use (Fig. 5). This was a period in which military airplanes in use at the close of hostilities were adapted for commercial transport service until newer and more modern ones, incorporating the latest technical lessons of the war, became available. Until this time the domestic airlines had used only two or three types of airplane (predominantly the Douglas DC-3) for all purposes. Immediately after the war, however, specially designed aircraft were developed, each suitable for the task it was to perform and the operating conditions which the individual airlines faced.

5. In 1947-49 the airlines began to take delivery of four-engine airplanes—the Constellation ("Connie"), the DC-6, and the Boeing Stratocruiser—and of two-engine airplanes—the Consolidated Vultee ("Convair") and the Martin 2-0-2 (Figs. 6-7). During these years several airlines retired their DC-3 and DC-4 aircraft from passenger service and began to dispose of the DC-3 even as a cargo carrier. The first airline to make this changeover was American Airlines, which



Courtesy: Trans World Airlines, Inc.

FIG. 4. The Boeing 307. This was the largest type of commercial plane used for service in the United States until early in 1946. The four 1,100 horsepower engines give a cruising speed of almost 225 miles per hour. This plane carried 38 passengers and a crew of five. This TWA "Stratoliner" is in front of the Kansas City, Missouri, airport terminal, which emphasizes its size.

on April 1, 1949, retired all its DC-3's and DC-4's from passenger service, leaving only DC-6's and Convairs. During that same year American Airlines sold all its DC-3's. The DC-3 aircraft owned by the trunk airlines were generally sold to feeder or local service airlines, to corporations for use as private airplanes, or were disposed of in the export market. In 1949 the Douglas Aircraft Co. introduced an improved version of the DC-3 known as the "Super DC-3," but this airplane was used by only one airline. The Air Transport Association reported, as of April 26, 1954, that 24 of the domestic scheduled air carriers were still operating a total of 322 DC-3's. At the same time, 275 of these aircraft were privately operated by corporate and individual owners. The Civil Aeronautics Administration originally set December 30, 1950, as the date this airplane should be retired from scheduled air carrier operation, but this date was later rescinded and the airlines using DC-3's were granted an indefinite extension of time.

6. In 1950-54 the increased competition between airlines demanded more speed, seat capacities, and luxury features, and these features were soon built into various aircraft. The DC-6B (Fig. 8) and DC-7 (Figs. 1 and 5) were introduced by the Douglas Aircraft Co.



Courtesy: Douglas Aircraft Co., Inc.

FIG. 5. The DC or Douglas Commercial group including the DC-7, DC-6, DC-4, and the Super DC-3 prototype. The commercial version Super DC-3 was not produced in any quantity, and the DC-4 is now out of production, although still in widespread use. The DC-6A (cargo version of the DC-6), DC-6B, and DC-7 are in full production.

The improved Super Constellation (L-1049) (Fig. 9) was put into service in 1953 by Lockheed Aircraft Corporation. In the twin-engine field, the Glenn L. Martin Co. produced their 4-0-4 (Fig. 10) and the Consolidated Vultee Aircraft Corporation entered the market with the Convair-340. The Douglas DC-7 began operation the latter part of 1953, and in 1954 Lockheed introduced a version of the Constellation equipped with the same type engine as the DC-7, the Wright Turbo Compound. Both of these airplanes are able to operate economically at a cruising speed of about 365 miles per hour, completing coast-to-coast flights in about eight hours. These new models will probably be the last of the large transport aircraft powered with piston engines. Those of the future will probably be powered with turbo-prop and turbo-jet engines.²⁰

In 1954, Capital Airlines placed an order with Vickers-Armstrong of England for 60 Vickers Viscount turbo-prop aircraft (Fig. 11) for delivery in 1955 and 1956. This made Capital Airlines the first

²⁰ For a review of aircraft design developments and a broad guide to the plans which the designers of tomorrow's transports may follow, see the 16th Annual Wright Brothers' Lecture delivered by William Littlewood, excerpts from which appear in *Aviation Week*, February 9 and 16, 1953.



Courtesy: Northwest Airlines

FIG. 6. The Boeing Stratocruiser. This four-engine, two-deck aircraft is designed to cruise at 300 to 340 miles an hour. Completely altitude conditioned, it will fly at 15,000 to 25,000 feet altitude, with a maximum range of 4,600 miles. Seventy-five passengers and a crew of five is normal capacity, although different airlines provide varying accommodations.

United States carrier to operate foreign-built equipment as well as the first to operate turbo-prop-powered aircraft. Previously, Pan American World Airways ordered several British de Havilland Comet III's for international operation, but their delivery dates were to be somewhat later.²¹

A number of factors have entered into the rapid and continuous modernization of airline equipment. The prospect of lower unit operating costs in terms of costs-per-seat-mile—despite higher costs-per-airplane-mile in the use of the larger and newer equipment—undoubtedly exerted a major influence. Traffic demands which the airlines could not meet without additional capacity, and the optimistic belief after World War II that still greater capacity would be required, also exerted powerful pressures. Yet, important as these and

²¹ In this connection it is interesting to note that the Aircraft Industries Association estimates that in 1953, 90 per cent of all commercial aircraft flying in the world had been produced in the United States.

other noncompetitive factors may have been, the history of equipment purchases leaves little doubt that the stimulus of competition has been the foremost factor influencing airline management in its constant search for new equipment. Thus, new equipment has usually been placed in operation first on the most competitive routes. The use of more modern aircraft by one company on such a route has been followed by a scramble on the part of competitors to introduce comparable or more advanced types, and conversely, the introduction of new equipment has generally been the slowest in services where competition was not very great. Although it is probable that the largest carriers would have led the way in equipment advances even without the stimulus of competition, it is significant that these carriers operate in perhaps the most highly competitive of the major markets. It is again significant that the smaller carriers, which have trailed in the acquisition of new property, have promptly developed equipment programs when changes in route structures have placed them in competitive situations with carriers utilizing more modern equipment.²²

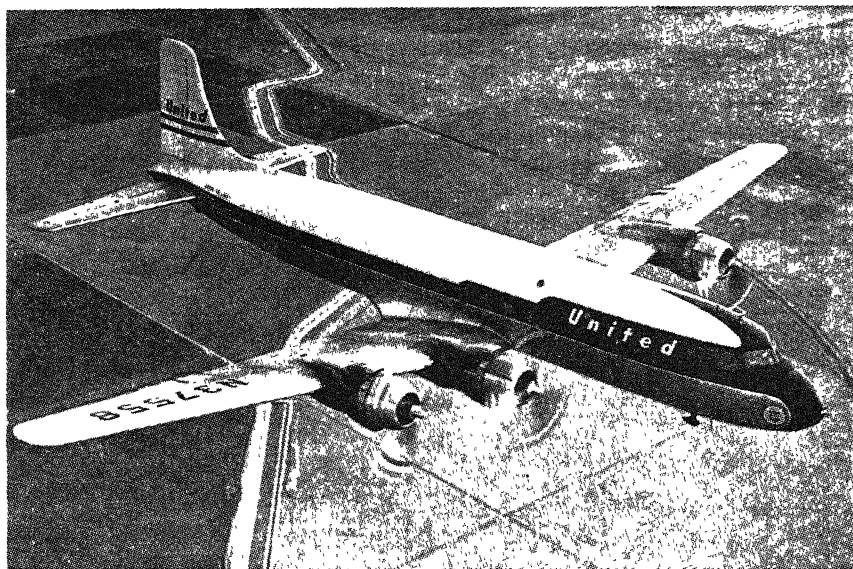
As might be expected, the greatest surge in equipment purchases has come during times of optimism when there has been the prospect of greater passenger demand, high load factors, and over-all expansion of the industry. On the other hand, the acquisition of new equipment has not been halted by adverse economic conditions or by pes-

²² The purchase of Vickers-Viscount aircraft by Capital Airlines illustrates this situation. These foreign-built aircraft were purchased to meet the stiff competition offered by the "Big Four"—American, United, Trans World and Eastern airlines—all of which parallel Capital to some extent and use Douglas DC-7's, Lockheed Super-Constellations, Convairs, and Martin 4-0-4's. Buying any of these aircraft would simply match the competitive lines. By cruising the Viscount at 335 miles per hour and introducing the novelty and improved comfort of turbo-prop operation, Capital hoped to increase its share of the traffic.

FIG. 7. Consolidated Vultee—Convair-Liner (240) known as the "Convair." This aircraft carries 40 passengers and a crew of from three to four at a cruising speed of about 270 miles per hour.

Courtesy: American Airlines





Courtesy: United Air Lines

FIG. 8. The Douglas DC-6B, which cruises at 315 miles per hour with a range of about 3,700 miles.

simism over the industry's prospects in the foreseeable future. What might be termed "luxury" equipment has been introduced under conditions that virtually eliminate a conclusion that economic considerations, other than competitive ones, warranted or prompted the action. It seems clear that competition, especially in the postwar period, has been sufficiently widespread and intense to play a major role in the continuous effort of each trunk-line carrier to obtain equipment superior to that of its competitors, and that the impetus afforded by this competition has largely accounted for there being made available to the public new equipment designed for the utmost in speed, comfort, and safety at the lowest possible operating cost.²³

*Future Motive Power*²⁴

Air transportation is a "service" business. Transportation is its product. The airlines must sell their product at a price the public is willing to pay. Their cost of production must be lower than their sales

²³ *The Role of Competition in Commercial Air Transportation, Select Committee on Small Business United States Senate (82nd Cong., 2nd sess.)* (1952), pp. 12-13.

²⁴ This section is adapted from a talk delivered by C. R. Smith, "The Turbine Engine and Air Transportation," and a discussion of same by Arthur D. Lewis before the Syracuse Transportation Conference, April 9, 1953. See also "Can Economical and Efficient Jet Airlines Now Be Offered?" *American Aviation*, August 30, 1954.

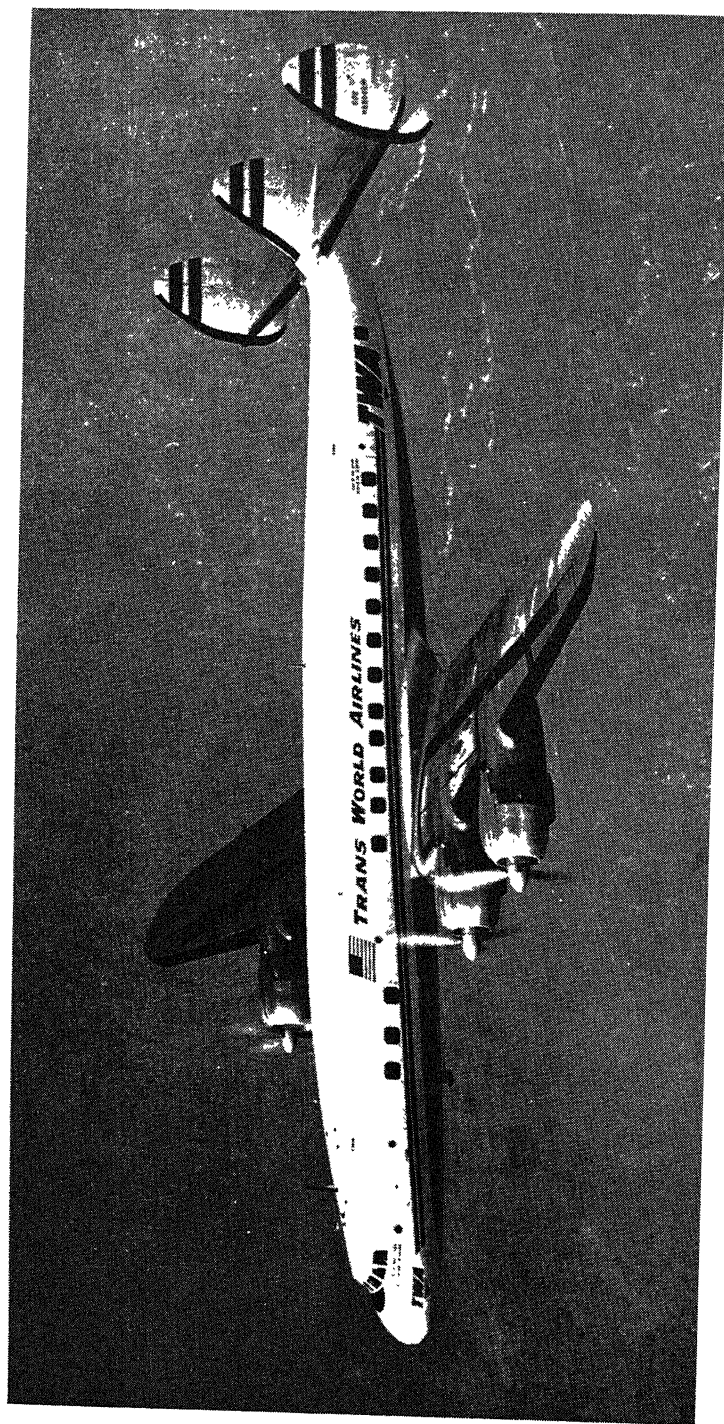


FIG. 9. The Lockheed Super Constellation (L-1049). The "Connie," as the earlier models of this airplane were called, was the first large postwar transport to be put into actual operation on an airline. This 10,800 horsepower model carries 64 passengers at speeds of more than 300 miles an hour.

Courtesy: Trans World Airlines



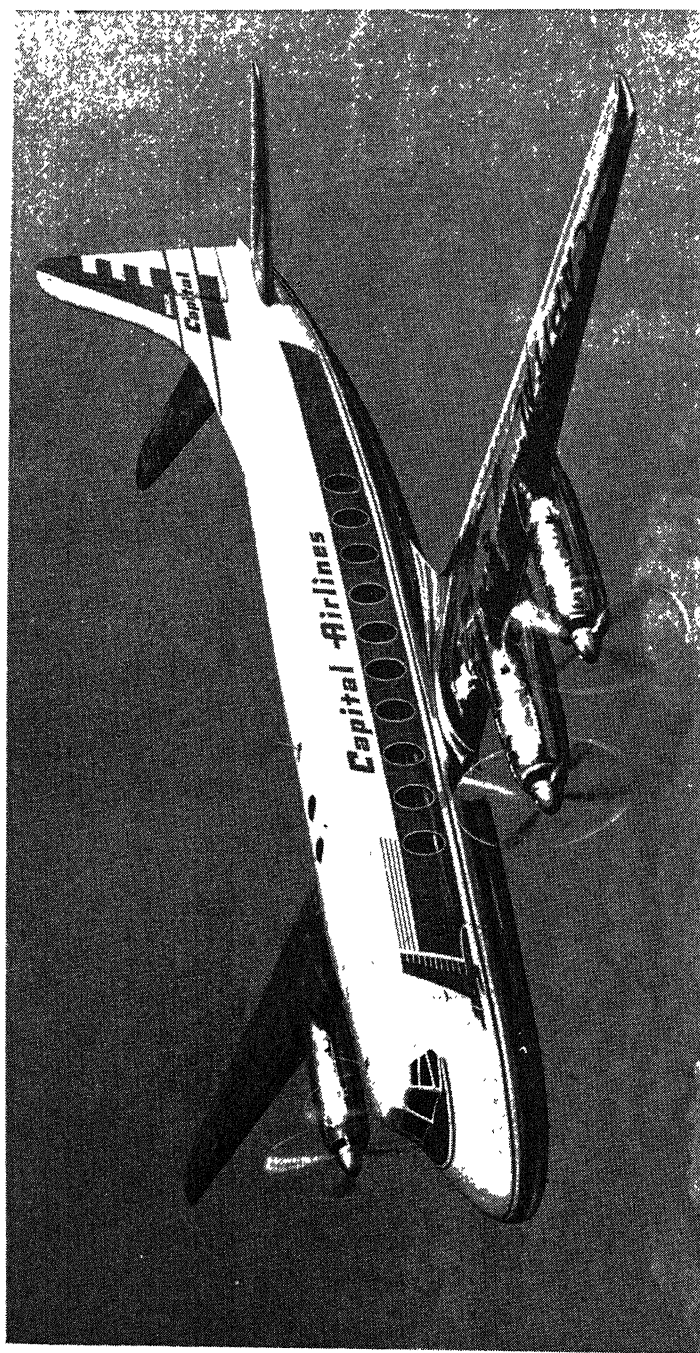
Courtesy: Eastern Air Lines

FIG. 10. The Martin 4-0-4, one of the fastest of twin-engine transports, with a normal cruising speed of 270 miles per hour and a maximum speed of 312 miles per hour. This model, known as "The Silver Falcon," carries 40 passengers.

prices or their rates and fares, or else they will not be long in business, unless their losses can be made up in some manner such as subsidies (see Chapter 13). Transport aircraft are the productive machines of the airlines, and if the lines are to have production costs lower than sales prices, they must have efficient productive machines. These are the economic factors to be considered when a new commercial airplane is developed.

Throughout the history of air transportation, aircraft have been designed around their power plants, or engines. Over the years there has been revolutionary progress in aircraft design, but ever since the construction of the Wright brothers' machine, the performance limits of the airplane have always been established by the power plant. This is true today and will probably continue to be so.

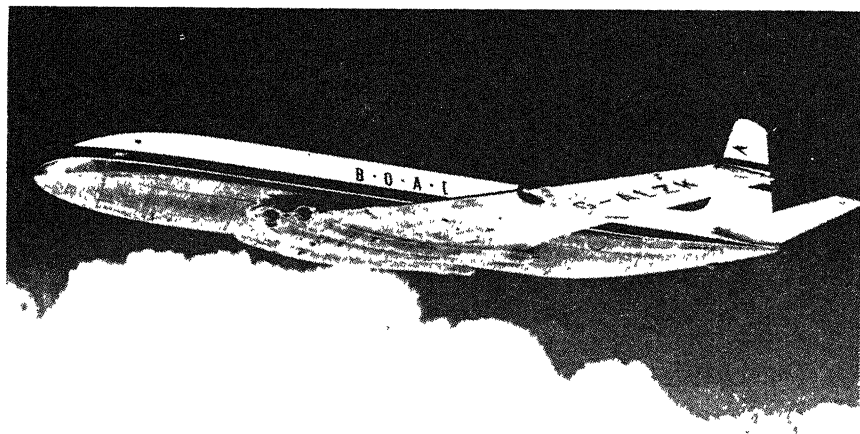
Prior to 1950, the basic principle of the power plant developed in aircraft has been the same as the engines in automobiles, despite their radical difference in shape; both types are piston engines. The United States has led the world in the continued development of this type of power plant. It is probable, however, that we will soon have reached the end of reasonable capacity for developing piston engines. There has been a continuing need for higher powers, both in military and civil fields, for airplanes are larger, and we expect superior performance from them. A new type of power plant, the turbine, has



Courtesy: Capital Airlines

FIG. 11. Vickers-Armstrong, Ltd., Viscount. The first turbo-prop aircraft to be purchased by a United States airline.

therefore been developed, offering better prospects for the higher powers required. That does not mean, however, that piston engines will no longer be operated. For many years after the introduction of new power plants, the majority of flights will continue to operate with the conventional type of airplane, for the piston engine is relatively



Courtesy: British Overseas Airways Corp.

FIG. 12. The De Havilland Comet I. This was the first pure-jet aircraft to be placed in regular commercial service. It is capable of cruising up to 490 miles an hour with a capacity pay load, as a 36 seater, of 12,000 pounds. BOAC began operating these aircraft in 1952.

efficient for operations of short and medium distance.

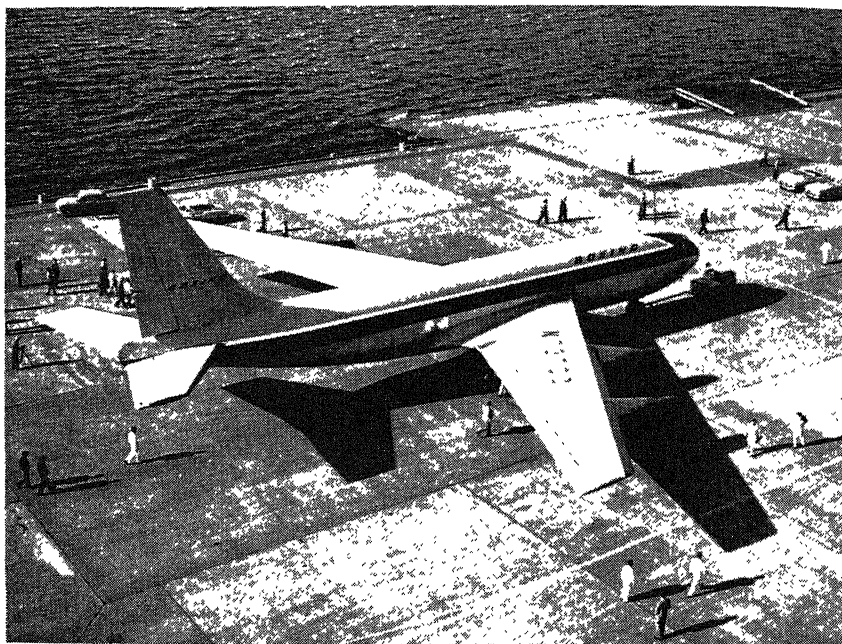
There are generally two types of turbine engines—one with the power plant geared to a propeller, usually called the “turbo-prop” (Fig. 11); the other without a propeller, generating “thrust” directly, called the “turbo-jet” (Fig. 12). The latter is the engine commonly meant when speaking of the pure “jet.” Each type has certain advantages over the other for commercial operation.

1. *The turbo-prop.* An airplane equipped with the turbo-prop engine will operate more efficiently at lower altitudes and with better fuel economy than the turbo-jet. It will require shorter runways for take-off and can be fitted with reversing propellers to give better control for landing and ground operation. It will usually be faster than the airplane equipped with piston engines and slower than an airplane equipped with turbo-jet engines.

2. *The turbo-jet.* An airplane equipped with the turbo-jet engine is not efficient at low altitudes, giving its best performance probably at about 40,000 feet. It will accelerate slowly and will usually require longer runways for take-off. It has no propellers to be reversed, for slowing the aircraft after landing, and is less efficient for ground con-

trol. Its fuel consumption, on a relative basis, is much higher than that of a turbo-prop installation. It is capable of very high speeds.

No one can now be sure about the future of the two engines, but it is safe to predict that jet power will ultimately lead all other types for air transportation. Progress in the design and production of more ef-



Courtesy: Boeing Airplane Co.

FIG. 13. The Boeing 707 jet Stratoliner-Stratotanker, the first jet commercial-type aircraft to be built in the United States.

ficient jet engines during the last few years has been amazing, and the trend will undoubtedly continue. Ultimately, the short-range aircraft will be equipped with the turbo-prop engine and the long-range airplane with the pure jet. The major part of the developmental work for both these engines has in this country been done for the military services. This has resulted in emphasis on the development of the pure jet, because of the military requirement for high speed. With the adoption of the Vickers-Viscount turbo-prop aircraft by Capital Airlines, this type of power took the lead in commercial use in the United States. In 1953, however, the Boeing Airplane Co. had a pure jet commercial-type airplane flying. (Fig. 13.)

Airline thinking points to some turbo-jet transports in domestic operation, principally on the long transcontinental runs, about 1958. There may, however, be a limited number flying on an experimental

basis before that time. Competition will probably force their use in the overseas field earlier than in domestic service. Some of the American aircraft manufacturers—Lockheed, Douglas, Fairchild, and Boeing—are already working on the development of turbo-jet transports, with the close collaboration of the airline engineers. Together, the airlines and manufacturers are endeavoring to discover the most appropriate size, speed, and other characteristics for such a commercial aircraft. It must, of course, operate with safety and it must have characteristics of operating economy which will permit it to operate profitably with reasonable loads.

There are no inherent mysteries about jet aircraft. Early in 1952, British Overseas Airways Corporation began operating a turbo-jet aircraft, the De Havilland Comet I (Fig. 12), on regular international schedules. This caused much comment here that United States airlines were falling behind in aircraft development. The basic problem in this country was not, however, the building of turbo-jet aircraft; many military models had been in production for several years. Rather it was that no one had yet been able to build a turbo-jet transport which would operate profitably on United States airlines. It may still take several years to perfect an engine and an airplane design which will provide the operating economy necessary to produce operating profit.

The crux of the problem is that the turbo-jet engine consumes an enormous quantity of fuel. Such a transport of reasonable dimensions will burn about five tons of fuel an hour—10,000 pounds. The cost of that much fuel is in itself quite high of course, but the greater factor in cost is that such a high proportion of the carrying capacity of the airplane must be devoted to transporting fuel, with relatively little space available to carry revenue-producing passengers, mail, and cargo. The real problem, therefore, is to produce a turbo-jet engine which will have greater fuel economy, and until that problem is solved there will be few turbo-jet transports in commercial operation by United States airlines. In military aircraft high speed is essential, irrespective of operating cost. But the test in civil aviation is whether the airplane can operate with profit, and if the turbo-jet transports are to operate profitably, their engines must operate with greater fuel economy. A good index of relative economy is the fact that the Douglas DC-6B consumes 8.9 pounds of fuel per mile, while a turbo-jet of about the same size, in spite of its much higher speed, requires about 20.4 pounds of fuel per mile.

Although fuel purchase price and fuel air transportation cost are the principal elements of increased operating expense of turbo-jet air-

craft, other elements are also involved. The turbo-jet engine is not yet as reliable as the reciprocating engine. It must be overhauled more often and its total operating life is shorter. Its initial capital cost may be five to ten times that of the reciprocating engine. Its cost per hour of total life operation may be ten to twenty times the present cost for reciprocating engines, depending on how long the turbo-jet engine will last in operation. Moreover, the engineering cost for the development of a new turbo-jet transport is estimated at \$25,000,000 to \$30,000,000, nearly all of which will have to be expended before even a single production model is available. The production models may cost \$3,000,000 to \$4,000,000 each, depending on size and quantity produced. Compare this with the cost of the DC-7 at \$1,600,000. The amortization of the cost of a turbo-jet transport over the estimated years of useful life would therefore require a monthly charge to operating expense much higher than comparable charges for the amortization of aircraft now operating.

On the basis of present estimates of over-all cost, the airlines of this country cannot operate turbo-jet transports at present fare levels without suffering a loss. There are a limited number of people who would be willing to pay higher fares to go 600 rather than 300 miles an hour, but there are not enough of them to make a business of it. The average traveler would prefer greater speeds, but only if they can be provided with little or no increase over the present fares. Should the airlines raise the price of air transportation to "break even" on the cost of operating a turbo-jet transport, they would lose most of their "average" customers; and if they lose that group, they lose the ability to produce, and sell, large quantities of air transportation.

There will be reasonable opportunity for the turbo-jet aircraft when it can operate as economically per passenger mile, or per ton mile, as the present type of airplane. There will be an even greater opportunity when its relatively high speed can provide a substantial reduction in operating cost, per passenger mile and per ton mile. As each new type of aircraft has been adopted by the airlines, the operators have achieved economies from increased speed and the consequent greater utilization of equipment. But as yet the turbo-jet aircraft demands a higher unit operating cost, not a lower one.

Many factors are exerting pressure on aircraft manufacturers in this country to expedite plans for developing a turbo-jet airplane. Before they can fix the final design, however, they will have to analyze thoroughly some of the economic aspects of airline operation (see

Chapter 5) and be conservative rather than optimistic in setting up the assumptions on which to estimate costs. The airlines, for example, are concerned with the obsolescence of the initial turbo-jet transport. Historically, rapid obsolescence of the first prototype of a series of aircraft has been the rule. A satisfactory and economical airplane represents a very fine balance of many interrelated variables, the most important of which are speed, range, and pay load. The problem of obtaining a proper balance is sufficiently complicated so that the manufacturers may have to produce one or two types of airplane before they learn how to build a good, well-balanced turbo-jet transport that will have long life in commercial service. The difficulty is increased by the fact that improvements in engine efficiency may come fairly rapidly after production of the first prototype, and these may radically affect the comparative economic potential of a second-round airplane.

The turbine-powered airplane will be used in domestic service as well as overseas service, but because of the difference in length of flight distances involved, it may be that no one turbo-jet transport can be made capable of economical operation in both services. International air services may require a jet airplane with a range up to 3,500 miles. On the other hand, the maximum range required for domestic service is about 2,500 miles. Excluding the very short haul, however, domestic services will involve flight distances of from 700 to 1,700 miles in length.

Preliminary estimates indicate that to be economical on domestic routes the turbo-jet transport must be large, substantially larger than the four-engine airplanes now used by the airlines. It will have to seat upwards of 100 people if it is to operate at costs comparable to those of present equipment in domestic services. It now seems doubtful that our manufacturers can build a competitive airplane which will have this pay load capacity and still have the range that may be desired for transoceanic service.

It would appear from past airline experience in this country that the only practical way to design a transport with a long commercial life is to design one that can profitably be used on shorter routes of secondary importance when later models with increased power are made available. If the first aircraft is capable of economical operation only on the longer segments, it will have little economic utility as a commercial vehicle when the second-round airplane is developed. If an attempt is made to develop one airplane to straddle the operating requirements of both domestic and foreign services, the results

may be a transport airplane not really suited for either, and one made rapidly obsolete by subsequent developments. This has not been a substantial problem in piston-engine use and would not likely be a major problem with a turbine-propeller airplane.

A second question of more serious concern relates to daily utilization of a turbo-jet transport. The airlines, or any given airline, may not be able to operate a small fleet of large jet airplanes at the same daily rate of utilization as a larger fleet of smaller piston-engine airplanes. The fast jet airplane will get its job done in less time than the slower piston airplane, and this will create a number of operating situations. For example, there will be less occasion to operate the jet airplane at night; intermediate ground times and turnaround time at terminal stations will comprise a higher percentage of the working day; and the ratio of aircraft undergoing operating and maintenance repairs to active aircraft may be higher.

The Helicopter

There appear to be three possible applications of the helicopter in common-carrier air transportation. These are in taxi services between airports and city-centers, on suburban "commuter" routes in large metropolitan areas, and in local-schedule intercity operation. In intercity operation, the helicopter is expected to augment and perhaps eventually replace the twin-engine fixed-wing aircraft used for many years in local scheduled operation.²⁵ The reasons for this are:

1. Many cities located on trunk lines today deserve air service, but are unable to afford the large airports required for fixed-wing aircraft.
2. At all distances up to 200 or 250 miles, the time required to travel from city-center to city-center by helicopter is less than that required in using any combination of fixed-wing aircraft plus surface vehicles to get to and from the airports.
3. The construction of superhighways to utilize the higher speed of the modern automobile may seriously affect the present local-schedule airline traffic volume.
4. Helicopter design is progressing rapidly and will continue to be accelerated by military requirements.
5. The operation of suitable helicopters will fill a definite void in our national air transportation system. This is especially true because

²⁵ Air Transport Association of America, Committee on Helicopters, *Preliminary Report on the Use of Helicopters in Scheduled Airline Operations*, 1953.



Courtesy: Los Angeles Airways

FIG. 14. The Sikorsky S-55 helicopter, the first to be licensed for commercial passenger operation.

of the relatively low capital cost requirements for landing and take-off facilities.

6. The value of the helicopter in national emergencies cannot be overestimated, particularly in cases where surface facilities have been destroyed.

The helicopter has two major advantages over fixed-wing aircraft: (a) it can operate from smaller terminal areas, and (b) it can fly at very low speeds. These are the main features which will permit air

transportation to expand into fields where the airplane cannot now compete with ground transportation.

The helicopter is a type of transport vehicle capable of integration in the air-transport industry's local schedule requirements within the next decade if one can be developed to operate at an over-all cost no greater than those involved in the use of twin-engine aircraft. This means that fares must be no higher than first-class air tariffs prevailing in recent years, adjusted to include ground transportation costs, so that the average fare to the passenger per mile will be no greater.

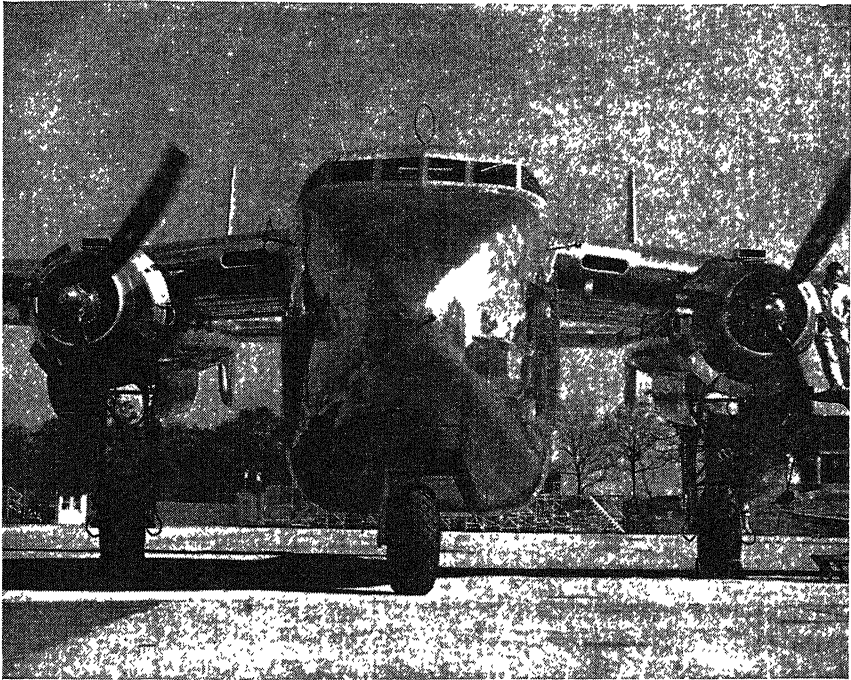
Successful exploitation of intercity helicopter passenger traffic will be directly related to the density of populations served, plus the distances between route cities. Where density is high and distance ranges between 40 and 175 miles, helicopter traffic will tend toward maximum passenger levels. On the other hand, if the density of population is relatively low, and the prevailing distance is within the helicopter limits mentioned above; or, if density is high and the distance is long, carrier operations are apt to be marginal. Density of population, therefore, becomes a prerequisite for successful helicopter operation. The second criterion, distance between cities, will determine the rate of foreseeable market expansion.²⁶

The Traffic Problem

In setting up the long-haul or trunk-line services, such as those supplied by the transcontinental lines, there are two types of service to be considered: (a) the through service for passengers traveling all the way from one coast to another, and (b) the service supplied passengers enplaning or deplaning at points en route. The latter type of passenger traffic brings up the consideration of the connecting lines.

As air travel increases, the connecting lines will add to their seat capacity by using more 40-passenger or larger aircraft. When the lines connecting with the trunk lines use larger equipment, it is not sound operating policy for the latter to use the same type, particularly when connecting lines are bringing in 40-passenger or larger airplanes at several points en route. If the traffic increases on local service or shorter north-south lines enough to justify greater seat capacities, the traffic must at the same time have increased at least a sufficient degree to justify greater seat capacity on the trunk lines or perhaps more frequent flights, or flights made in more than one section.

²⁶ *Ibid.* See also, James B. Edwards, "Economic Considerations of the Transport Helicopter," a paper presented before the Institute of Aeronautical Sciences, New York, N.Y., January 29, 1954.



Courtesy: Fairchild Engine and Airplane Corp.

FIG. 15. The Fairchild Engine and Airplane Corp. "Packet," known as the "Flying Box Car" (note the shape of the fuselage). The entire output of these aircraft has been taken by the United States Air Forces, and none have been used commercially since they were first introduced during World War II.

The manufacturers' problem in meeting the demand of the airlines for aircraft capable of use on their through express services, with large pay loads, is one of providing the range plus the pay load plus the passenger and cargo (mail, freight, and express) capacity required for the route to be covered. All transport airplanes have a fuel capacity far in excess of that which would be filled if a full pay load were also carried. Commercial aircraft are designed to carry either of two possible useful loads: a large pay load for a short range, with most of the fuel tanks empty, or a relatively small pay load for a long range.

The practice of the airlines in loading at terminals has been to fuel only after the pay load was known and then only up to an amount which gave the maximum allowable gross weight, which ordinarily meant that the fuel tanks were from one-half to two-thirds full. This amount of fuel must, of course, equal the minimum required to complete the contemplated trip safely. The type of airplane which could be used economically either on long trips or over long stretches of impossible landing weather or else on short trips, with a very heavy

pay load, contributes to the flexibility of airline operation. The airlines require this flexibility in an ever-increasing degree. For example, it would be desirable to have an airplane capable of carrying 40 to 60 passengers from New York to Washington in 60 to 80 minutes and then able to take off with 50 passengers for Miami, with ample fuel for a 2,000-mile flight in case of emergency.

For overland services, there is also a need for a smaller land airplane in addition to the types in the 30- to 50-passenger class. The cost of operation remains almost constant for any given scheduled service, whether the passenger seats are filled or not. Thus it becomes economically unwise to equip a route on which density of traffic is light with aircraft costing \$100 or over per hour to operate when such a route can be equipped with small airplanes operated at a cost of \$50 to \$60 per hour.

For overseas routes, the demand seems to be crystallizing around a large land-type aircraft of from 60- to 100-passenger capacity which is capable of nonstop flights of 3,000 miles. Longer range than this proves to be unnecessarily costly because of the excessive fuel loads required and the resulting increase in power needed and in cost of operation. The land plane lends itself to higher altitudes and greater speeds than can be obtained with flying boats; and with multi-engines, forced landings at sea have been virtually eliminated. In addition, land planes are adaptable to overland plus overocean flying, which is involved in many international operations.

*Passenger Reaction*²⁷

The reaction of passengers to aircraft is of great importance, particularly in planning airplanes for the future. Upon favorable passenger reaction largely depends the ability of an airline to attract repeat business. Much still has to be done to make air travel as comfortable as it might be.

Air conditioning involving the control of temperature, ventilation, pressurization, and humidity has been receiving much attention from aircraft manufacturers. Temperatures are usually maintained between 70° F and 75° F, with cabin air-heating capacity sufficient for cruising flight through atmospheric temperatures as low as -40° F.

²⁷ See R. D. Kelly, R. L. McBrien, and L. G. Kelso, *Evaluation Criteria for Transport Aircraft* (New York: Institute of the Aeronautical Sciences, n.d.); Ross A. McFarland, *Human Factors in Air Transport Design* (New York: McGraw-Hill Book Co., 1946); W. W. Davies, *Cargo Aircraft* (New York: Pitman Publishing Corp., 1946); Albert A. Arnheim, *Comfortization of Aircraft* (New York: Pitman Publishing Corp., 1944); Albert P. Elebash, "Passenger Aircraft Facilities—Design and Operation," an address before the S.A.E. National Air Transport Engineering Meeting, Chicago, 1946.

Ventilation it is believed, should be at a rate between 30 and 40 cubic feet per minute of sea level density air per passenger, while air velocities within the passenger compartment should not exceed 40 feet per minute. The degree of pressurization required depends upon the average cruising altitude at which operations are conducted. It seems to be agreed that the cabin pressure altitude should be between 8,000 and 11,000 feet as a maximum but with most flights pressurized at no more than 6,000 feet. In other words, although the aircraft may be flying at 20,000 to 35,000 feet altitude, the pressure in the cabin will be as if the plane were flying at a maximum height of 11,000 feet. Humidity in the range of 25 to 40 per cent is usually provided.

Noise levels for long-range aircraft should be lower than for the short to intermediate ranges. Some recent aircraft have not dealt satisfactorily with the noise problem. Vibration is closely associated with noise and likewise continues to be a major annoyance in certain models.

Rideability, while difficult to evaluate, affects comfort greatly, both on the ground and in the air. Very poor passenger reactions may be the result of disturbing movements from poor ride qualities. Hard rolling qualities, which jolt passengers during ground maneuvering, are readily noticeable even to the unseasoned traveler. Aerodynamic instabilities occasioned by rough air that create any feeling of indefiniteness of control are annoying and in some passengers aggravate tendencies toward airsickness. Interior illumination, if inadequate, is quickly detected by passengers who want to read. The direction and distribution of light are just as important as its intensity. On the whole, however, the air traveler today is not as concerned or as interested in the intimate details of aircraft design as was the more adventurous prewar air patron. All the average passenger wants today is safe, comfortable, and fast transportation to his destination. He has no desire to be part of an "adventure," or to share in the problems of an airline. He just wants to buy a service. If a traveler wants to go to Dallas and discovers that there is no Constellation to Dallas, he isn't going to cancel his trip. He will take the fastest available service to Dallas—and will patronize whatever airline gives him the best service.²⁸

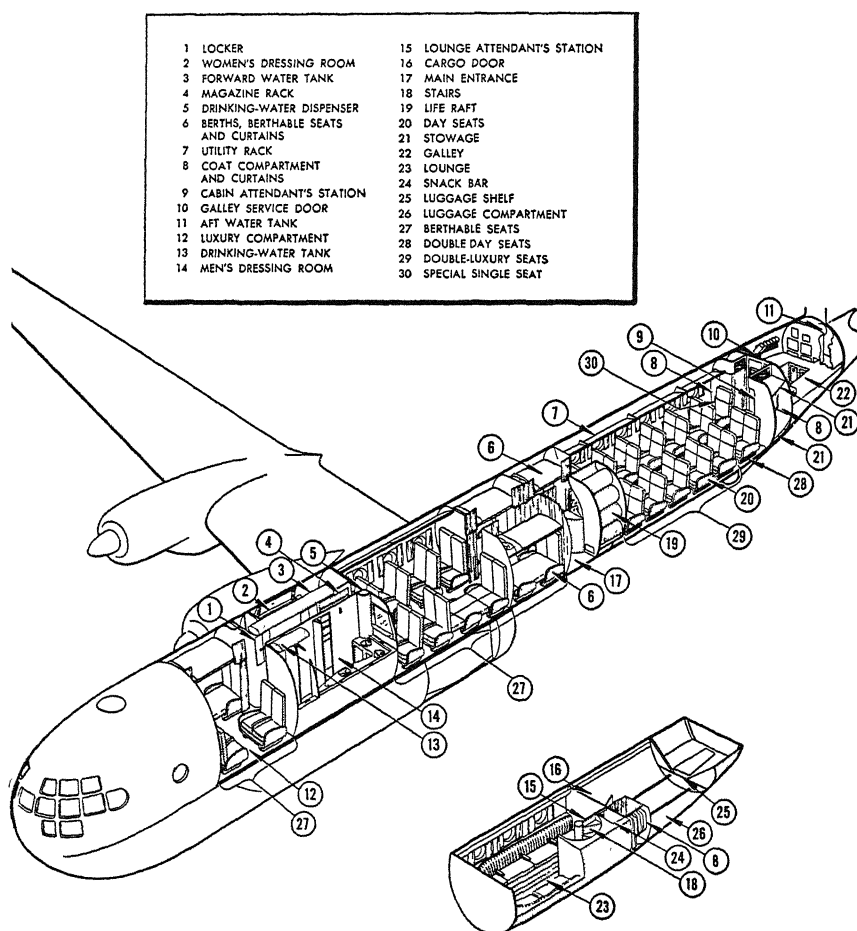
Airline Evaluation of Transport Aircraft

The airlines have been giving a great deal of thought to the type of airplane they feel most desirable. The following is a summary of the

²⁸ Wayne W. Parrish, "Postwar Service Needed with Postwar Planes," *American Aviation*, July 1, 1947.

principal design criteria and operating requirements which airline engineers regard as most desirable from the operator's point of view:

1. Any transport aircraft must be planned around its passenger cabin and cargo compartment for passenger operation, or around its cargo compartments if specifically designed for freight transportation. Care must be taken in the layout of the passenger compartment to provide maximum comfort without waste of space. There should be no unnecessary frills which add to the weight; and interiors should be designed for ease of maintenance and servicing, particularly seats, floor covering, lighting fixtures, lavatories, and galleys. Baggage and



Courtesy: Boeing Airplane Company

FIG. 16. Cutaway showing interior arrangement of Boeing Stratocruiser. This particular 75-passenger interior arrangement is that of Pan American World Airways.

cargo compartments should be readily accessible, and designed and located to permit rapid loading and unloading. (Fig. 16.)

2. Transport aircraft must be made easy to maintain and service. This will probably be brought about through decentralizing controls and accessories to reduce maintenance time. It may also be achieved by providing quickly removable accessory panels and inspection doors to allow rapid change in case of failure. It should be remembered that maintenance and service costs continue throughout the life of an airplane.

3. It is felt that a capacity of 100 passengers should, probably, be the limit for domestic operation. The highest permissible system speed and frequency of schedules are more important from the traffic viewpoint than the capacity of individual aircraft. Furthermore, the time taken to load and unload a greater number of passengers and their baggage becomes an important ground handling problem, to say nothing of the greater number of cabin attendants required for personal service during flight.

It is now almost axiomatic that smaller airplanes and more frequent schedules provide a flexibility considered essential to profitable operations. Even granting a tremendous increase in air travel, the airlines are beginning to feel they may have difficulty in filling large craft of 200 to 400 passengers such as those envisioned several years ago. Since a high percentage of seat occupancy has been, and will continue to be, essential to profitable operation, this is a serious consideration.

It is also true that insurance costs for very large aircraft can be prohibitive, since airlines must take out insurance to cover not only the cost of the airplane itself but also their public liability, which is based upon the number of passenger seats in the airplane.

Another factor determining maximum passenger capacity for domestic operation is the ratio of equipment reserves needed to provide adequate and reliable service. Larger airplanes mean that there will be fewer of them for a given traffic volume, and therefore less spares which might be conveniently located along a route to eliminate operation delays.

In deciding the adaptability of a particular airplane to a specific type of operation, airlines usually classify the criteria used into the following groups:²⁹

²⁹ Adapted from Kelly, McBrien, and Kelso, *supra*.

1. *Operating Conditions.* In deciding whether to purchase a particular airplane, a study of the type of service to be rendered by it is, of course, essential. Will the operation be primarily one of passenger transportation or freight transportation, and of what proportion of each? What length of route segments are involved? What volume of business is anticipated? The answers to these questions will in large part determine the general type of airplane that is required.

Next comes the consideration of the first cost, or purchase price, which has an all-important bearing on the size of the fleet with which a given airline can conduct operations. A realistic allowance must also be made for the procurement of spare parts at the time of original purchase. For example, an amount equal to about 20 per cent of the purchase price of an airplane has been stated, in a number of instances, as necessary for the procurement of spare parts to start operation and carry it throughout the first year. Additional allowance also must be made for the procurement of necessary new types of ground equipment needed for servicing the airplane during maintenance stops, as well as for handling passengers and cargo at terminals. The sum of these amounts constitutes the initial investment in equipment.

The cost of introducing a fleet of new airplanes into scheduled service is very hard to predict. Airline accounting procedures have so far been inadequate to permit the development of empirical formulas by which this expense might be anticipated for new aircraft. Such expense does, however, constitute a sizable item. The education and training of ground and flight crews is in itself a time-consuming direct expense; in addition, the personnel involved in this program must be removed, for a time, from the revenue-producing operations of the airline. The period of introduction for a new airplane is usually considered to last one year from the day on which the first schedule was operated. During that time maintenance expenditures usually run appreciably higher than they do after the airplane has been in service for a longer period and the so-called "bugs" have been eliminated. Accordingly, a portion of the maintenance expense should be charged to the cost of introduction. There will also be schedule delays or flight cancellations which result in loss of revenue, both attributable to the introductory phase of operation.

Probably the most important consideration in predicting the operating economy of an airplane is an analysis of the route or routes on which it is to be used. Included in such an analysis should be the block speed and schedule time required, the maximum pay load

which can be carried, the pay-load limiting conditions applicable, the maximum revenue potential, the direct operating cost, and the break-even load factor.³⁰ Such an analysis provides the operator with an indication of just how effectively a particular airplane can be used in his system of schedules. The segments which yield the least revenue and which must be operated at the lowest percentage of pay load available for profit are obviously the ones which should be scheduled with the lowest frequency, other things being equal.

Generally speaking, the direct operating expense is only a step in the economic analysis of an airplane. It tells only the cost per airplane-mile or per ton-mile of operation. If the airplane is to be used primarily on routes having poor traffic potential, then minimum operating expense is the primary economic criterion. For most routes it is desirable to have an airplane that provides for traffic development even though the operating cost may be proportionately higher. The equipment required on the ground for loading, unloading, and servicing aircraft should be considered along with the direct operating expense. For certain designs the initial outlay of capital for special ground equipment can be considerable. The cost of maintaining this equipment is also quite high.

The final indicator of an airline's economic success with an airplane is the annual percentage return on the initial investment in flight equipment. Flight equipment is an airline's only source of earnings. Therefore, when the purchase of a new airplane is being considered, it is of paramount importance to have an advance indication of earning power in relation to the capital invested. If the manufacturer supplies complete cost, weight, and performance data, a route analysis can be prepared. From this and a knowledge of how the airplane will be scheduled over the airline, the anticipated earning power can be computed.

2. *Safety.* The evaluation of an airplane from the consideration of operational safety is very important, but has to be based largely on experience. An analysis of the airplane should be made from the

³⁰ "Block speed" is the speed in miles per hour from airport ramp to airport ramp. The time involved includes taxi time to the end of the take-off runway, engine warm-up and check time, take-off, ascent to cruising altitude, descent from cruising altitude, and landing and taxi time to unloading ramp.

"Pay load" is the weight of revenue and nonrevenue passengers, mail, express, freight, company material, and passengers' baggage.

"Load factor" is a percentage figure arrived at by dividing the load potential of capacity into the actual load carried. Example: a 60-passenger plane with 30 passengers aboard has a load factor of 50 per cent. Cargo load factors are figured the same way, by dividing the potential load weight into the amount actually carried.

standpoint of the personnel procedures, both normal and emergency, required to operate it. Operating procedures that require the participation of personnel, other than to direct the course or regulate the speed of flight, are usually evidence of inadequacy of design. The more complicated such procedures are, the less adequate the design. Complexity of systems, such as hydraulic, fuel, and air conditioning, must be avoided since maintenance may be unduly expensive and the probability of malfunctioning may be increased. Complex systems usually require involved procedures for alternate operation in the

TABLE 1
AIRCRAFT OPERATED BY UNITED STATES DOMESTIC AND INTERNATIONAL
AIRLINES, 1944-53

(Domestic)

Aircraft (Make and Model) As of Dec. 31	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
Beechcraft:										
C17B.....	1									
D18C.....				6	6					
A35.....						11	10			
Bell: B47D.....						6	6	6	6	6
Boeing:										
247D.....										
307.....		5	4	4	5	5	5			
377.....						10	10	16	16	16
Cessna:										
190.....						7	8	6		
T50.....						3	6	5	5	
Curtiss: C46.....					2		2			
Convair:										
240.....					68	93	103	102	99	90
340.....									25	103
Douglas:										
DC-3, 3S.....	256	383	470	459	435	413	410	425	381	331
DC-4.....			158	186	168	160	146	137	124	126
DC-6, 6B, 6A.....				83	104	104	113	139	161	175
DC-7.....										10
Lockheed:										
10.....		3	3		6	6	6			
18.....	16	18	11	12	12	11	11	11	11	11
L49.....			12	22	23	23	34	34	37	37
649.....				14	13	13	3	6	5	5
749.....						19	49	56	59	62
1049.....								5	24	31
Martin:										
202.....				9	24	24	33	12	21	25
404.....								18	96	100
North American: AT6.....			1							
Sikorsky:										
S43.....	2	1								
S51.....				3	5	5	5	3	3	3
S55.....									5	8
Stinson:										
SR.....	12	10	10	7	7					
W.....	1	1								
TOTAL.....	288	421	674	810	878	913	960	981	1,078	1,139
Single-engine.....	14	11	11	10	12	29	29	15	14	17
Twin-engine.....	274	405	488	490	553	550	571	573	638	660
Four-engine.....		5	175	310	313	334	360	393	426	462

TABLE I—Continued

International

Aircraft (Make and Model) As of Dec. 31	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
Boeing:										
307.....	3	3	3							
314.....	8	7								
377.....						31	35	29	28	27
Convair, 240.....					20	20	16	14	14	14
Douglas:										
DC-2.....	2	2								
DC-3.....	49	68	63	47	36	23	19	19	21	24
DC-4.....		13	50	78	77	72	64	54	46	45
DC-6, 6A, 6B.....				3	5	6	6	6	26	42
Lockheed:										
10.....										
18.....	3									
L49.....			31	22	21	21	20	18	14	9
649.....				4						
749.....					16	4				
Martin, 130.....	1									
Sikorsky:										
S42B.....	3	3								
S43.....	1	1								
TOTAL.....	70	97	147	154	175	177	160	140	149	161
Twin-engine.....	55	71	63	47	56	43	35	33	35	38
Four-engine.....	15	26	84	107	119	134	125	107	114	123

Source: CAA, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954).

event of irregularity. Even though an airplane may have been certified by the Civil Aeronautics Administration, the airline should investigate its flight characteristics thoroughly. The Civil Air Regulations under which aircraft pass tests prior to "certification" are based on minimum requirements and therefore do not necessarily represent the operator's desires. The airline must determine the degree to which the airplanes being considered measure up to regulations. There are, for example, various characteristics that may contribute to pilot fatigue or to the complexity of piloting procedures. Again, design details, particularly those of equipment and equipment installation, which influence the probability of fire occurring, should be subject to the closest scrutiny. In this connection, the possibility of passengers and crew surviving and being rescued following a crash during take-off or landing should be given full consideration. The location and simplicity of operation of escape means, the vulnerability of fuel tanks to rupture, and the incorporation of other items which will increase the probability of survival or facilitate rescue must be fully appraised.

3. *Performance.* There must be adequate separation between the minimum and maximum usable cruising speeds to insure flexibility for maintaining on-time schedule reliability in the face of varying

wind conditions. The minimum speed is determined by the flight-handling characteristics of the airplane. The maximum speed is determined by the maximum power the operator deems advisable to use continuously. Usually, this power is appreciably less than the rated maximum cruising power. Differences in time for taxiing and run-up and in climb performance make the block-speed comparison of more importance than a strict comparison of cruising speeds. The operator must use experience and judgment in estimating the average time for taxi and run-up when making block-speed comparisons.

Landing aids have lessened the requirements that an airplane be able to maneuver readily and make approaches to airports under conditions of poor visibility. However, the requirement has not been eliminated, especially for the airplane designed for short-haul operation. The short-haul airplane has less chance of avoiding inclement weather and for some time yet must operate into airports not equipped with landing aids. Also, emergency conditions sometimes arise where a landing must be made without aids.

Weight restrictions imposed by performance requirements of the Civil Air Regulations must be closely scrutinized. For certain operations these restrictions may be the limiting factor, rather than the structural limits of the airplane itself. It may be entirely impractical to serve certain airports because of the restrictions imposed by the runway requirements for take-off or landing. Restrictions imposed by the required climb performance for take-off, approach, or landing configurations may also be appreciable, especially at high-elevation airports. The climb performance required en route may become restrictive for flights over high terrain.

The Commercial Transport Fleet

The fleet of aircraft operated by the domestic and international United States airlines in 1953 amounted to a total of 1,300, as reported by the Civil Aeronautics Administration. This figure, like all those in Table 1, is adjusted to avoid duplications. In other words, the aircraft used in both domestic and international operations by some airlines have been included in the figure representing domestic operations. In 1954, the Civil Aeronautics Administration³¹ estimated a total of 1,470 scheduled air-carrier aircraft in use by the airlines of this country, over four times those in operation in 1944. Only 15 four-engine aircraft were in use in 1944, but these totaled 585 in

³¹ CAA press release of December 26, 1954.

1953 and 655 in 1954, or 44 per cent of the total. Two-engine aircraft totaled 698 in 1953 and 790 in 1954.

In addition to the aircraft listed in Table 1, there were 70 operated by the certificated all-cargo operators in 1953 and 177 by the large irregular carriers and irregular transport carriers, thus giving a total fleet of 1,547 commercial aircraft for that year.³²

³² Figure for all-cargo operators from CAA *Statistical Handbook of Civil Aviation*, 1954. Figure for irregular carriers from Brief of Bureau Counsel to Examiners, *Investigation of Air Service by Large Irregular Carriers and Irregular Transport Carriers*, CAB Docket No. 5132 *et al.* (1954).

Chapter

2 * AIRPORTS AND AIRWAYS

AVIATION can progress effectively only as far as the state of its ground facilities permits. Unfortunately, the maintenance and improvement of ground facilities has, up to the present, been largely separate from the technical development of aircraft themselves. The size and speed of aircraft, the power of the engines used, and the functions and responsibilities of the air transport industry have all been pushed ahead of the ground facilities upon which they must depend. Aircraft have increased in size and speed beyond the capacities of most of the major terminal airports as well as the airways.

Until all the country's air navigation and traffic control systems, major air terminals, and related ground facilities have been improved to the point where they can adequately handle the aircraft using them, the airlines will be unable to provide absolutely safe, reliable, and efficient public service; and until they can provide such a service, the air carriers will be unable to rise much above the present plateau in their development. This means that we must begin to think ahead in airport design and construction, in methods of communication and traffic control, since these facilities are essential to both our national economy and national security.

For some time to come, the nature of air navigation and terminal facilities will be conditioned by the limitations of the human pilot. Plane size, maneuverability and approach speeds, traffic-control methods, and landing aids must all be within the grasp of human physiology and psychology. However, the time of automatic flight control is approaching; and the aids whose immediate installation is essential for use by a human intermediary should also be adapted, where possible, to integration with the "superhuman" flight era which is sure to come. Some of these aids will be outmoded when that era arrives, but there is certain to be a transition period of considerable length in which both types will be used.

*The Airport System*¹

An airport may be defined as any locality adapted for landing and taking off of aircraft and which provides facilities for their shelter, supply, and repair and for the regular reception or discharge of air passengers or cargo. Throughout the history of aviation, airports have been a problem; and the need for more or better landing and take-off facilities has been an ever-present concern to all those active in either civil or military aeronautics.

Table 2 shows the growth of the airport system of the United States from a total of 1,036 in 1927 to 6,860 in 1954. Official statistics are available only from 1927 because it was not until after the passage of the Air Commerce Act of 1926 that an official government agency was made responsible for airport and airway matters. An airport count was, therefore, first made in 1927 by the Bureau of Air Commerce of the United States Department of Commerce. Prior to that time airports had, of course, been developed, often as the result of local flying interest, so that by 1912, when the first transcontinental flight was made, with many stops and delays, there were about twenty recognized "landing fields," as they were then called, in the United States.

After the end of World War I, considerable interest in airport development was aroused by individuals who had purchased surplus Army planes and wanted to use them; by the Army itself, now conscious of the importance of civil landing fields to the free movement of its aircraft; and by the Post Office Department, particularly in connection with the development of a transcontinental air mail route. By 1921, therefore, the total number of airports had reached 271, of which 145 were municipal. By 1925, municipal airports had increased in number to 310, commercial fields to 225, and intermediate fields on the air mail routes to 63. The aviation boom of the late twenties was just beginning; the Air Commerce Act of 1926 was about to be passed, supplying the regulation which responsible aeronautical interests had long wanted; and scheduled air transport under private management was just getting a serious start through the letting of contracts for mail carriage. More and more cities were wanting to be included on the country's air routes, and by 1927 the

¹ This section is partially adapted from John H. Frederick, *Airport Management* (Chicago: Richard D. Irwin, Inc., 1949), chaps. i, ii, iv.

TABLE 2
AIRPORTS AND LANDING FIELDS, 1926-54

CALENDAR YEAR	TOTAL	COM-MERCIAL	MUNIC-IPAL	CAA INTER-MEDIATE	ALL OTHERS	LIGHTED TOTAL	AIRPORTS OF ENTRY	
							Regu-lar	Tempo-rary
1926	*	*	*	92	*	*	0	0
1927	1,036	263	240	134	399†	*	0	0
1928	1,364	365	368	210	421†	*	0	0
1929	1,550	495	453	285	317†	*	10	8
1930	1,782	564	550	354	314†	640	10	30
1931	2,093	829	780	404	80	680	9	36
1932	2,117	869	777	352	119	701	10	39
1933	2,188	938	827	265	158	626	11	42
1934	2,297	872	980	259	186	664	11	42
1935	2,368	822	1,041	291	214	698	12	43
1936	2,342	774	1,037	296	235	705	12	43
1937	2,299	727	1,053	283	236	720	21	34
1938	2,374	760	1,092	267	255	719	37	23
1939	2,280	801	963	266	250	735	39	21
1940	2,331	860	1,031	289	151	776	37	21
1941	2,484	930	1,086	283	185	662	36	19
1942	2,809	1,069	1,129	273	338	700	37	11
1943	2,769	801	914	240	814	859	35	10
1944	3,427	1,027	1,067	229	1,104	964	36	9
1945	4,026	1,509	1,220	216	1,081	1,007	30	11
1946	4,490	1,929	1,424	201	936	1,019	30	16
1947	5,759	2,849	1,818	178	914	1,447	47	1
1948	6,414	2,989	2,050	161	1,214	1,521	47	0
1949	6,484	2,585	2,200	139	1,560	1,480	46	0
1950	6,403	2,329	2,272	76	1,726	1,670	46	0
1951	6,237	2,042	2,316	57	1,822	*	47	0
1952	6,042	1,731	2,336	*	*	1,858	56	0
1953§	6,760	†	†	†	†	1,050	55	0
1954§	6,860	*	*	*	*	*	*	*

* Not available.

† Include auxiliary marked fields, later classified as to ownership, commercial or municipal.

‡ See Table 6 for 1953 breakdown according to the new definitions effective July 1, 1952.

§ Includes seaplane bases and heliports. This breakdown no longer available for previous years.

Source: CAA, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954); CAA, Press release of December 26, 1954, for 1954 estimates.

number of municipally operated airports was 240 and commercial airports, 263.

An aviation boom, already well under way, was greatly accelerated by the transoceanic flights of the summer of 1927, and many new municipal fields were opened. Even more striking was the increase in the number of commercial airports. In the eager rush of a speculating public to put money into aviation, funds were provided for chains of commercial airports far in excess of any possible needs.

The first federal aid was extended to civil airports, not held primarily for the use of the federal government, through the Civil Works Administration in the fall of 1933. With the passage of the Civil

Aeronautics Act of 1938, the provisions of the Air Commerce Act of 1926 forbidding the participation of the federal government in airport development were repealed. Since then the Administrator of Civil Aeronautics has been empowered to make plans for the orderly development and location of landing areas and to acquire, establish, operate, and maintain such areas or facilities upon landing areas owned and maintained by others but not to acquire any airport by purchase or condemnation. The expenditure of federal funds on nonmilitary landing areas is subject to certification by the Administrator, and such landing areas must be reasonably necessary for use in air commerce or in the interest of national defense. Since 1933, federal funds have been the predominant factor in airport development. Up to 1944 it is estimated that average capital expenditures for civil airports were divided as follows: federal funds, 72.1 per cent; state funds, 1.0 per cent; municipal funds, 18.8 per cent; commercial and private funds, 8.1 per cent. Through 1944, capital expenditures for civil airports were estimated to amount to a total of \$1,027,159,416, of which \$740,705,171 were federal funds, \$10,155,265 state funds, \$192,950,000 municipal funds, and \$83,348,980 commercial and private funds.²

In the decade before World War II, the number of airports in the United States fluctuated somewhat below the 2,500 mark, but no large expansion program was undertaken. During the war, however, several hundred large airports were constructed to serve military needs. Unfortunately, many of these were located in out-of-the-way places not suited for civil airports; and because of the ban on private flying during the war years, very few small airports were built. Beginning in 1945, many of the military airports (classified under "all others" in Table 2) were turned over to nearby municipalities or abandoned entirely, which partly accounts for the growth in municipal airports during 1946 and 1947. The growth in commercial airports during those same years was almost entirely due to the large amount of instructional flying caused by the various federal-aid plans for veteran education.

The end of World War II found the United States with an airport system which had not kept pace with the great expansion in civil aviation activities. The acute necessity for more airports was recognized by the Congress which enacted the Federal Airport Act of 1946.³ This law as amended directs the Civil Aeronautics Administration to pre-

² See Civil Aeronautics Administration, *Airport Service* (Washington, D.C., 1945).

³ *Public Law No. 377, 79th Cong., 2nd sess.* (approved May 13, 1946).

pare and revise annually a national plan for the development of public airports in the United States, Alaska, Hawaii, the Virgin Islands, and Puerto Rico and to specify the type of projects thought necessary to provide a system of public airports adequate to antici-

TABLE 3
1947-54 FEDERAL-AID AIRPORT PROGRAM—NUMBER OF AIR-
PORTS AND FEDERAL FUNDS ALLOCATED

As of Dec. 31, 1953

By Airport Class		
Class	Number of Airports	Federal Funds (000)
I.	234	\$3,665
II.	257	10,723
III.	328	26,697
IV.	218	42,019
V.	76	35,896
VI and over	53	73,543
Seaplane facilities	17	150
TOTAL.	1,183	\$192,693

By Airport Service Type		
Service Type	Number of Airports	Federal Funds (000)
Secondary.	475	\$ 12,015
Feeder.	319	22,446
Trunk.	247	40,857
Express.	68	24,298
Continental.	32	30,032
Intercontinental.	16	37,933
Intercontinental express.	9	24,962
Seaplane facilities.	17	150
TOTAL.	1,183	\$192,693

Source: CAA., *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954).

pate and meet the needs of civil aeronautics. The same act also authorized federal expenditures of \$500,000,000 over a seven-year period, which were to be matched by equal sums from local public agencies known as "sponsors." Table 3 shows that up to December 31, 1952, 1,183 airports received federal aid amounting to \$192,693,000. These funds were "matched" by \$194,909,000 in funds supplied by sponsors, usually municipalities, so that the total program to that date amounted to \$387,602,000.⁴

⁴ CAA., *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954), p. 11.

The decline in the total number of airports between 1949 and 1952 is largely accounted for by the abandonment of a number of intermediate landing fields by the Civil Aeronautics Administration and the fact that a number of smaller commercial airports, operated in connection with veteran flight-training programs, were forced out of business when this program was curtailed. The increase in the total number of airports between 1952 and 1954 is accounted for by sea-plane bases and heliports. The latter had not been included in the totals before 1954.

By 1953, it was apparent that the federal-aid program was not achieving what had been intended, since it was not developing an integrated airport system. Much more money was being spent on Class III and larger airports, operated by municipalities and other governmental entities which were able to raise funds to match the federal funds, than on Class I and II airports, which served smaller communities unable to raise such funds (see Table 3). The Civil Aeronautics Administration decided, therefore, to reappraise the situation before asking Congress for additional airport aid. It was also felt that larger airport operators were now in a position to finance themselves fully if forced to do so. Some airport operators had, in fact, been refusing federal funds because of restrictions on airport development and operation which the use of such aid entailed.

Early in 1954 the Department of Commerce announced⁵ a decision that some continued federal participation in financing airport development was desirable, but that such participation would be justified only if it were concentrated upon airport locations and types of construction essential to the nation's broadest interests.⁶ The Department stated that it could not justify the expenditure of federal funds on projects which, though desirable, were predominantly of local rather than national importance, or on airport terminal buildings. Terminal buildings are regarded as revenue producers and, as such, have the greatest prospect for independent financing without federal aid.

The federal-aid airport program has been only moderately effec-

⁵ Address by Robert B. Murray, Jr., Under-Secretary of Commerce for Transportation, before the Washington Chapter, National Defense Transportation Association, March 16, 1954. This was later confirmed as part of our national aviation policy in the report of the Air Coordinating Committee, *Civil Air Policy* (Washington, D.C., 1954), pp. 26-27.

⁶ From statements made before the Senate Committee on Interstate and Foreign Commerce in May, 1954, it would appear that the criteria of national importance used by the Department of Commerce would be 3,000 enplaned passengers per year; or a based-aircraft population of 30; or a combination of these factors, with 100 passengers being equal to one based aircraft. As of 1954, 760 airports (accounting for 99.6 per cent of the total domestic scheduled airline traffic) met this eligibility test.

tive in establishing a system of airports adequate to meet the present and future needs of the foreign and domestic commerce of the United States, of the postal service, and of the national defense. The chief reason for this is that the program has never operated on anything like the dollar level originally planned. The Federal Airport Act contemplated Congressional appropriations of approximately \$100 million a year, whereas actual appropriations have varied from \$45 million in 1947 to none at all in 1954. In the first years of the program, from 1947 to 1950, fund appropriations were held back by the inevitable complications of starting a complex national program of integrated airport development and by the requirement that local governments match the federal grants. After 1950, appropriations were successively reduced, until in 1954 not a single grant was made for new projects. In the fiscal year 1955 (beginning July 1, 1954), the program was reactivated by the appropriation of \$22 million, but since 1950 the level of available funds has been far below that necessary for any extensive national program.

It has become evident that we will not obtain from all communities the matching funds needed to build an integrated system unless a way can be found to render additional financial assistance to smaller cities and less populated counties. These have no means to raise the funds locally, and have met with little or no success when they have applied to their state legislatures for aid. The states, for the most part, have not yet been convinced they have the same responsibility in building an integrated airport system as they do in building an integrated highway system.

The fund deficiency has been made more serious by the formula used for allocating funds among the states (half on the basis of population and half on the basis of area) and by the discretionary fund's being limited to 25 per cent of the appropriation. This last provision has made it impossible for the Administrator of Civil Aeronautics to reassign sufficient funds from states not using their allocation to states needing additional amounts. The combination of low appropriations, rigid distribution formulas, and small discretionary funds has prevented granting substantial federal aid to many of the larger air terminals and local-service airports.

Granting federal assistance for airport construction seems the best way for the federal government to discharge its responsibilities in this field. Such assistance finds a precedent again in our public highway program, where federal government, like state, has played an important financial role. Federal control, designed to produce a na-

tional system of airports, is much more acceptable to local government if it is achieved through federal contributions than if it is a purely regulatory program.

Airport Classification

The airports of the United States have been classified in various ways: (1) according to their size, (2) according to the types of service they are designed to furnish, and (3) according to the nature of their ownership or control.

TABLE 4
AIRPORT SIZE CLASSIFICATION

Recommended Minimum Standards	Class I	Class II	Class III	Class IV	Class V
Length of landing strips*	1,800–2,700 ft.	2,700–3,700 ft.	3,700–4,700 ft.	4,700–5,700 ft.	5,700 ft. and over
Width of usable landing strips	300 ft.	500 ft.	500 ft.	500 ft.	500 ft.
Length of runways	None	2,500–3,500 ft.	3,500–4,500 ft.	4,500–5,500 ft.	5,500 ft. and over
Width of runways	None	150 ft. (Night opr.) 100 ft. (Day opr. only)	200 ft. (Instr.) 150 ft. (Night opr.)	200 ft. (Instr.) 150 ft. (Night opr.)	200 ft. (Instr.) 150 ft. (Night opr.)

* All of the foregoing landing strip and runway lengths are based on sea-level conditions; for higher altitudes increases are necessary. One surfaced runway of dimensions shown above is recommended for each landing strip for airports in Classes II, III, IV, and V.

Source: Adapted from CAA, *Airport Design* (Washington, D.C., 1949).

The size of an airport is usually indicated by the length of its landing strips and runways. The Civil Aeronautics Administration has set up minimum-size standards, as shown in Table 4. One thousand feet in length of landing strips and runways is added in each case above Class V to make Classes VI, VII, and VIII. Every airport has been assigned either to one of these classes or to a sub-1 group, if its size standards do not meet even the lowest class.

Table 5 shows the Civil Aeronautics Administration classification of airports by types of service, together with the minimum recommended standards for runway lengths, landing strip, runway and taxiway widths, grades, and pavement loading. *Personal* airports are designed to handle light (up to 3,000 pounds) aircraft for small communities or urban areas. *Secondary* airports are for larger

TABLE 5
AIRPORT SERVICE CLASSIFICATION

TYPE OF SERVICE	RUNWAY LENGTH* (FEET)	MINIMUM WIDTHS (FEET)			MAXIMUM GRADES (PER CENT)			PAVEMENT LOADING PER WHEEL (IN 1,000 LBS.)	
		Land-ing Strip	Run-way	Taxi-way	Effec-tive†	Longi-tudinal‡	Trans-verse§	Single Wheel	Dual Wheel
Personal....	1,500-2,300	200	50||	20||	2	3	3	||	||
Secondary.	2,301-3,000	250	75||	30||	1½	2	2	||	||
Feeder...	3,001-3,500	300	100	40	1	1½	1½	15	20
Trunk line	3,501-4,200	400	150	50	1	1½	1½	30	40
Express.	4,201-5,000	500	150	60	1	1½	1½	45	60
Continental... . .	5,001-5,900	500	150	75	1	1½	1½	60	80
Intercontinental ...	5,901-7,000	500	200	75	1	1½	1½	75	100
Intercontinental ex- press	7,001-8,400	500	200	100	1	1½	1½	100	125

* Designed for sea-level elevation, standard sea-level temperature of 59° F and zero per cent effective gradient.

† Maximum effective gradient obtained by dividing the maximum difference in runway center-line elevation by the total length of the runway.

‡ When necessary longitudinal taxiway grades may be as high as 3 per cent.

§ Percentages shown are for pavement. To improve run-off, the slopes on unpaved areas may be increased to 2 per cent, and to 5 per cent for a distance of ten feet from the edge of pavement.

|| Pavement not required.

Source: CAA, *Airport Design* (2d ed.; Washington, D.C., 1949).

(2,000-15,000 pounds) aircraft in nonscheduled flying activities and will suit the needs of many smaller communities. *Feeder* airports are to serve those communities certificated for this type of scheduled local airline service. *Trunk-line* airports are designed for smaller cities on trunk airline routes. *Express* airports are designed for important cities or junction points on trunk airline routes; they accommodate the largest aircraft now in use or planned for the immediate future with a gross weight of 50,000 pounds and over. *Continental* airports are those designed to accommodate aircraft making long non-stop domestic flights. *Intercontinental* airports are designed to serve long international flights. *Intercontinental express* airports serve the highest type of transoceanic flights. The last three types are found at the major trade and industrial centers of the country, such as New York, San Francisco, Chicago, Los Angeles, Miami, San Francisco, and Boston.

Table 6 shows the airports of the United States classified, as of early 1953, by size group and type of ownership and control. A *municipal airport* is defined as one under public ownership and/or control, open to public use with aircraft services generally available. A *commercial airport* is one under nonpublic ownership and/or control, but nevertheless open to public use with aircraft services generally available. A *limited airport* is one intended for private use but

TABLE 6
AIRPORTS BY CLASS AND TYPE OF OWNERSHIP, 1953

CLASS	TOTAL	TYPE				
		Municipal	Commer- cial	Limited	Military (Civil Use)	Private
TOTAL	6,042	2,336	1,731	1,231	363	381
Sub I . .	1,274	201	334	552	12	175
I	2,411	731	1,015	516	23	126
II.	976	464	317	113	31	51
III	571	412	42	33	67	17
IV.	437	319	19	12	79	8
V.	181	117	4	2	56	2
VI and over..	192	92	0	3	95	2

Source: CAA, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1953).

allowing public use; aircraft services are limited or not available and the ownership and/or control may be public or nonpublic in nature. *Military airports*, as the name implies, are owned and/or controlled by a branch of the military service but open to some civil use. A *private airport* may be under public or nonpublic ownership and/or control, but is open only for uses authorized by the operators.

The runway standards shown in Table 5 were established by the Civil Aeronautics Administration during the latter part of 1947. Prior to that time the only classification used by that body had been the size grouping shown in Table 4. It was felt, however, that a further guide was needed in connection with the administration of the Federal Airport Act and that manufacturers and operators of transport-type aircraft should be informed what airport runways would be available at airports with various use characteristics. It was expected that airlines would thereafter secure equipment and establish procedures permitting operations from the standard runways in accordance with established Civil Air Regulations. Such standards also would offer assurance to municipalities and other airport builders that their facilities would not become obsolete with the advancement in design and construction of transport aircraft.

There has been some criticism that the Civil Aeronautics Administration service classification and runway specifications are too rigid in view of the rapid development of the air-route pattern. Present airline routes represent a considerable increase over those contemplated even a few years ago, and the airline pattern of this country certainly has not been finalized. Moreover, no single individual or group of individuals can predict, with any degree of accuracy, the type of service to be provided any community in the future and hence

the exact form which an airport should now take. The city which to-day is entitled to a "trunk-line" airport may within a comparatively short time need nothing more than a "feeder" airport or may need to have an "express" facility, depending on the movements of population, the development of industry, and other factors working upon our expanding national economy. The air transport industry is not ready, nor is the Civil Aeronautics Administration in a position, to assure any community of the type of service to be provided from now on and, consequently, the type or size of airport needed. Even to attempt to do so means one of two things—either a stagnation in the development of commercial aviation or the creation of a false assurance in the minds of those responsible for airport planning and development in the community concerned.

The classification of airports on a service basis and the consequent standardization of facilities (particularly runway lengths and strengths) by federal authority tends to remove administrative discretion from airport builders and operators and deprive them of an opportunity to extend the future growth of air travel for their communities. The failure to consider the differences in the traffic-generating possibilities of individual communities results in the imposition of limits on runway construction which represent, at best, a doubtful estimate of the type of service that should be rendered a particular community. If we can accept the contention that the air-route pattern in this country has not been finalized, then we must recognize that it is impossible to build runways in accordance with the type of service a city is *now* receiving. We must avoid adopting an inflexible system which may dwarf the development of aviation in various communities, placing them in each case in a certain category that cannot be changed, regardless of any unforeseen economic changes or other influences.

Airport Adequacy

The adequacy of the airport system of the United States may be judged on several bases: (1) airport location in relation to the cities served, (2) airport equipment, (3) extent of protection of landing areas exclusive of the airport itself, and (4) services available for the traveling public.

1. *Location of Airports in Relation to Cities Served.* To serve a city or town to the best advantage, an airport should obviously be located as close as possible to its center. The travel time between the city center and the airport is more important to the airline user than

is the distance in miles. More than half the airports serving the principal cities of the country are a half-hour or more from their centers. Much has been done during recent years to improve airports themselves, but it has seldom been found possible to move them to points nearer city centers. In many instances, air transportation suffers because of the remoteness of airports; this is especially true where relatively short flights are involved and where the time saved over surface transportation is not substantial.

Even though it is desirable that airports lie close to the centers of the communities they serve, there are occasions in which it proves of economic advantage for two or more neighboring communities to compromise their demands and find a location reasonably convenient to all. In such cases it is often possible to build a better airport than would be justified for any one of the towns alone.

2. *Airport Equipment and Buildings.* Wholly adequate airport equipment (without regard to the size of landing area) must include paved runways, taxiways, aprons, fueling facilities, hangars, and lights.

There seems to be no question about the desirability of paved runways or a hard surface of some sort, but many smaller communities seem unable to assume the financial burden even of bearing the sponsor's share of the cost for a combined federal government and local runway project. Hangars are also expensive and are lacking at many of the smaller airports. Airport lighting is of many sorts, from the rotating beacon flashing the airport code, to the boundary and high-intensity approach and runway lights; and very few airports, other than the largest, are really adequately lighted.

3. *Protecting the Vicinity of the Airport.* The landing area for aircraft is more than just the ground space required for the runways, loading and unloading ramps, and storage and servicing facilities. The air space surrounding all landing areas is of so much importance that the approaches to the ground space should be considered a part of any airport. In order to protect the approaches, tall buildings, trees, and communication and power lines must not become a hazard. The air space as well as the ground space must be protected, and some control over neighboring property is, therefore, necessary. To purchase outright enough land to make the protection complete would often require that the acreage needed for the landing area proper be multiplied by five or more. Such a purchase is usually impossible because of cost or some other reason; and so the remaining alternatives are to regulate the area by zoning and to acquire by

purchase, lease, or condemnation the rights to unoccupied air space above the surrounding property. The maintenance of an elevated structure near an airport has also been enjoined a nuisance by court order in cases where spite was shown to be a motive. Control of the surroundings is one of the major necessities of sound airport development; yet it seems to have been neglected in far too many cases. (See Chapter 4.)

According to the National Institute of Municipal Law Officers, there are a number of ways to protect airport approaches: (1) voluntary action by the hazard owner; (2) purchase of all land near the airport and razing of hazards located thereon; (3) purchase of air space rights over all land near the airport; (4) acquisition of air space rights over land near airports by use of the power of eminent domain in order to raze present hazards and to prevent future ones; (5) police condemnation of hazards to use of airports; (6) zoning to prevent and eliminate hazards near airports; (7) use of the commerce power by the federal government; (8) use of the war power by the federal government; and (9) use of the postal power of the federal government.⁷

About half the states have adopted laws giving cities or counties the right to purchase land and, if necessary, to acquire it by condemnation for airport purposes, either for original establishment or for later improvement and enlargement, and also to use either negotiation or condemnation to acquire the rights to the air space surrounding the airport as an assurance against its invasion by obstructions. The procedure of acquiring air rights has, however, been little used; and, in the event of condemnation of such rights, the courts find scanty precedent for a guide in fixing values.

The simplest solution is zoning, which eliminates separate dealings with a multitude of property holders, but little has been done with this method. While most states have airport-zoning legislation of some sort, only a few have acts considered clearly adequate by the Civil Aeronautics Administration. Too many leave discretion to municipal authorities and little has been done with it. An essential fact of the present status of the American airport system is that the possi-

⁷ See National Institute of Municipal Law Officers, *Airports and Air-Plans and the Legal Problems They Create for Cities* (Washington, D.C., 1939). See also Charles S. Rhyne, *Airports and the Courts* (Washington, D.C.: National Institute of Municipal Law Officers, 1944), chap. viii; Air Transport Association of America, *Airline Airport Design Recommendations* (Washington, D.C., 1947), Part II; J. Nelson Young, *Airport Zoning* (Urbana, Ill.: University of Illinois, 1948); L. Welch Pogue and James F. Bell, "The Legal Framework of Airport Operations," *Journal of Air Law and Commerce*, Summer, 1952, pp. 253-73.

bility of safe and efficient use of an airport is entirely dependent on its surroundings and that few communities have so far adopted any measures to protect airports against the erection of high neighboring structures that would seriously impair their value.

4. *Services Available for the Traveling Public.* It has been well said that "the airport is the sales counter of air transportation"; but in achieving this, the objectives of the municipalities and of the airlines often conflict. One objective should be to make the airport attractive to the general public and to sight-seers, affording them parking place, an opportunity to see airport operations conducted, and a place where an inexpensive meal may be purchased. The second objective, particularly important to the airlines, is to make high-class waiting room, ticketing, and restaurant facilities available to airline passengers. Achieving the first objective develops new passengers; achieving the second is most certainly necessary to retain the passengers now using air transportation. A good airport terminal building, while it must contain all the conveniences of a good railroad station, must certainly avoid incorporating the bad features of the latter and must make provision for comfort, style, privacy, and quiet efficient service.

Few airport restaurants are up to minimum standards as far as the needs of air travelers are concerned. The time has come when a well-run, high-class restaurant can be made to pay at practically any major airport. There are several outstanding examples where restaurants are attractive, where good food is served, and where the operators are making money. In contrast to these few, however, the average airport restaurant would not do credit to a bus station.

Many airports lack provision for passengers to go aboard or deplane without getting out in the rain and walking some distance. All-weather canopies for protection against rain and snow, as well as sun, seem to be an essential part of a proper airport. Individual umbrellas and similar makeshift devices are certainly not in keeping with the standards of service that the airlines should maintain.

Viewed in the light of certain expansion, automobile parking facilities at most airports are at present wholly inadequate. In addition to outdoor parking facilities, the ideal airport should also include a garage for the use of travelers who are planning to return within a day or so and who would find storing their car at the airport a decided convenience.

Often the whole atmosphere of an otherwise well-equipped airport is destroyed through discourteous and unprepossessing municipal

employees who give to the air traveler a distinctly poor impression of that community. An airport administration providing an appearance of military proficiency in the deportment of all personnel, whether airline or municipal, instills confidence in keeping with the major effort of the airlines to provide safety. This is particularly important. There is nothing which detracts so much from the creation of confidence as the hurrying about of many members of the personnel, the indifference of employees, or the appearance that the whole terminal operation is being conducted without precision and order.

*Airport Management*⁸

The commercial airports used by air carriers are generally publicly owned and managed. It has become recognized that an airport or system of airports around a city is as much a part of the transportation facilities of a metropolitan area as are its streets and boulevards, for both are designed to serve private and commercial owners of various and sundry types of vehicles.

There are several forms of airport administration:

1. By an already existing department of the city government, such as the department of public works or the park department.
2. By a new department established in the municipal government to manage the airport.
3. By an independent airport commission, which may be bipartisan and selected by the mayor or equivalent officer. The commission then selects the airport manager, who will be directly responsible to the commission rather than to any department of the city government.
4. By establishment of an airport authority particularly where there are several airports serving a city or owned jointly by several municipalities or by a city and county.

Cities using the first method of airport administration, retaining it in one of the already existing departments, generally do so either because they do not feel the airport-management problem of sufficient importance to set up a separate department or because they could not, at least when the system was adopted, afford to employ a competent airport manager and so placed the responsibility on the shoulders of an already existing department head, where it remains for various reasons.

Any advantages which may have existed in years past from com-

⁸ This section is adapted from Frederick, *op. cit.*, chap. viii.

bining airport administration with other city department activities have tended to disappear as the complexities of airport operation have increased; and, particularly in the larger cities, definite weaknesses of the merged form of organization have developed. These may be summarized as follows:⁹ (a) Authority and responsibility are often divided among too many individuals or groups, and decisions are thus delayed; (b) The route of authority which must be followed before a decision can be reached is often too long and circuitous. (c) Airport activities are commonly subordinated to the major activities of the department in charge of the airport. (d) Despite incidental similarities between airport operation and the other activities of a certain city department, it will be found in nearly every case that the essential management requisites are basically different. For example, some cities retain control of their airport activities in the park department. They did so at the beginning chiefly because field maintenance could be conveniently carried on by that department. Before airport management and maintenance became as complicated as they now are, the chief job was grass cutting and other work similar to that already done by park employees. It has also been argued by advocates of park-department management that taxpayers will not be so prone to insist on an airport paying its way if it possesses the aura of a park and recreational facility. This is, of course, very shallow reasoning in spite of the fact that numerous city authorities contend that it is the only possible way to secure funds while an airport is in the early stages of development.

Separate airport departments have been created in many cities, which realized that the problems involved and the skills required in airport administration are sufficiently unlike those of any existing department to warrant special treatment. Also, as airport operation has become more complex, the sheer volume and complexity of the problem has become an undue burden on the department which may have been entrusted with it earlier. In other cases, "the principal motivation for setting up a separate department has been the desire to emphasize and bring to closer public attention the entire problem of aviation and airports."¹⁰ Finally, when the airport is a separate department, it is felt that a higher-type airport manager may be attracted to it. The chief disadvantage of handling the airport as a sep-

⁹ See Lynn L. Bollinger, Alan Passen, and Robert E. McElfresh, *Terminal Airport Financing and Management* (Boston: Harvard Graduate School of Business Administration, 1946).

¹⁰ *Ibid.*, p. 259.

arate department is that it tends to add to the complexities of city government, thus making it still harder for the chief executive to maintain contact with all divisions.

The independent airport commission has a number of advantages which have led to its adoption in many cities. These are:¹¹ (a) Individuals of a higher caliber, interested in aviation from the viewpoint of civic development rather than from a commercial one, are attracted to the nonsalaried commission. (b) Various local groups, directly interested in airports, may be represented on the commission. (c) Continuity of policy and freedom from political interference are more possible, particularly where terms of commission members overlap. Experience has, however, shown the disadvantages of the commission form of airport administration to be: (a) Commissioners are not always able to reach agreement among themselves. (b) Interposing a commission between an airport manager and the chief executive of a city sometimes results in conflict. (c) Unpaid commissioners sometimes lose interest in the airport even while continuing to serve.

The airport authority has the following advantages: (a) It is, if modeled after the Port of New York Authority, as most of them are, an independent corporate agency. Its management, its methods, and its techniques are those of a modern business organization rather than those of a state or municipality. (b) It is nonpolitical in operation, with members serving, as do the board of directors of a business corporation, usually without compensation and appointed for overlapping terms by the several political subdivisions concerned. (c) It supervises projects of a self-supporting character and relies on the revenues from these projects rather than on funds that come directly or indirectly from taxation. (d) It is adaptable to a regional approach, an aspect which makes it particularly useful in the development of interstate, joint municipal, or joint municipal and county projects.

The ability displayed by management in maintaining and improving individual airports will bear a close relationship to earnings and to the degree of public support required in the future. The best method of municipal control is difficult to evaluate because the business and profession of airport management are still, and for some time will be, in the early stages of growth. No system of management or control can yet be said to have definitely proved itself in the sense that is true in other fields of municipal management. Adequate op-

¹¹ *Ibid.*, p. 261.

portunity has not yet been afforded to test fully the effects of policies thus far adopted.

*Airport Income*¹²

Airport charges and consequent income, or lack of it, have been the most controversial aspects of the airport problem for many years. However, as time has gone on, general principles of airport charging have gradually developed. These general principles have been based on the belief that, while airports have many of the general characteristics of public facilities, they should not be provided entirely at public expense. In other words, users of the various facilities should pay, in the form of fees, rentals, and other charges, enough to permit well-managed airports to be financially self-supporting.

The common understanding of airport charging also takes account of the fact that there are two chief parts to every airport: (a) the landing area, including runways, taxi strips, aprons or ramps, and their appurtenances; and (b) the building area. Since the landing area has many of the characteristics of what is commonly called a "public utility," it is generally agreed that charges for the use of this area should be based on cost of operation. It is not considered good airport management to try to make a profit from the landing area. It is, however, good practice to expect landing-area users, over a period of time, to bear the full costs of supplying and maintaining the facilities they need and use.¹³

The building area differs from the landing area in that here the value of the space used is a more logical base for charging than is the cost of the service rendered a tenant or holder of a concession. It is, therefore, considered good airport management to obtain as much revenue as possible from all space in the building or terminal area rather than simply to cover costs. This area, therefore, is the place where the chief profit-yielding activities of an airport may be carried on. There is, however, a complicating factor. Whereas the landing area is used only by aviation activities—the activities that "make" the airport, that encourage other activities to be carried on there, and that should be encouraged by the lowest possible charges—the building area is used by both aviation and nonaviation interests. It is again

¹² This section is adapted from Frederick, *op. cit.*, chaps. x, xi.

¹³ It is generally held that "costs" as here used should include an interest charge on the entire amount of capital used and also amortization of all depreciating parts of the landing area, such as runways and lights. Costs should not include any depreciation charge on the land investment, which is generally considered a nondepreciating asset.

considered good management to charge aviation activities for space in the building area—such as that required for handling passengers, mail and cargo, hangar use, and the like—on a cost basis or on a basis as close to cost as possible. Nonaviation activities, on the other hand, may be charged on a basis to produce maximum revenue, since it is the aviation activities of the airport that help to make possible other businesses there. It is the nonaviation activities that should produce the “profit” of any well-managed airport.

Sources of airport income may be classified as follows:

1. Landing fees from commercial operations. It is quite generally agreed that the most equitable form for such charges is on the basis of the gross weight of the aircraft using the landing area. Costs should be a basic factor in determining landing charges; and since the heavier the aircraft, the greater the expense of maintenance of runways and the greater the investment required in construction, this weight basis seems fairest to all concerned. It also makes for greater uniformity throughout the country than did previous methods based on the number of schedules operated over a given time. (It is true that weather and other considerations existing in different sections of the country will bring about slightly different operating-cost figures, but the difference will be negligible.) The weight basis will also enable an airport manager to estimate the number of planes which will use his facility and their gross weight, and from this information he can easily determine what his approximate landing revenue for any future period will be.

2. Fixed base and other flying operations, such as flight instruction, aeronautical schools, flying clubs, charter and contract service, industrial services, aircraft rentals and sales, and other miscellaneous flying activities operated on a concession basis.

3. Hangar rental and other storage.

4. Gasoline and oil sales.

5. Aircraft, parts, and accessories sales.

6. Repair, overhaul, and maintenance.

7. Space rental in terminal buildings for such aviation activities as the Weather Bureau, Civil Aeronautics Administration offices, United States Post Offices, Customs and Immigration Services, airline ticket offices, airline operations offices, and the offices for aircraft service operators and others directly concerned with aviation.

8. Rental of space in terminal buildings for such nonaeronauti-

cal activities as restaurants, cocktail lounges and bars, barber shops, valet services, public stenographers, tourist bureaus, newstands and gift shops, advertising display cases and dioramas, clubrooms, spectator ramps, baggage lockers, vending machines, sleeping accommodations, and various recreational facilities.

9. Industrial area rentals on various sections of the airport for manufacturing plants, processing plants, air freight warehouses, and cold-storage plants.

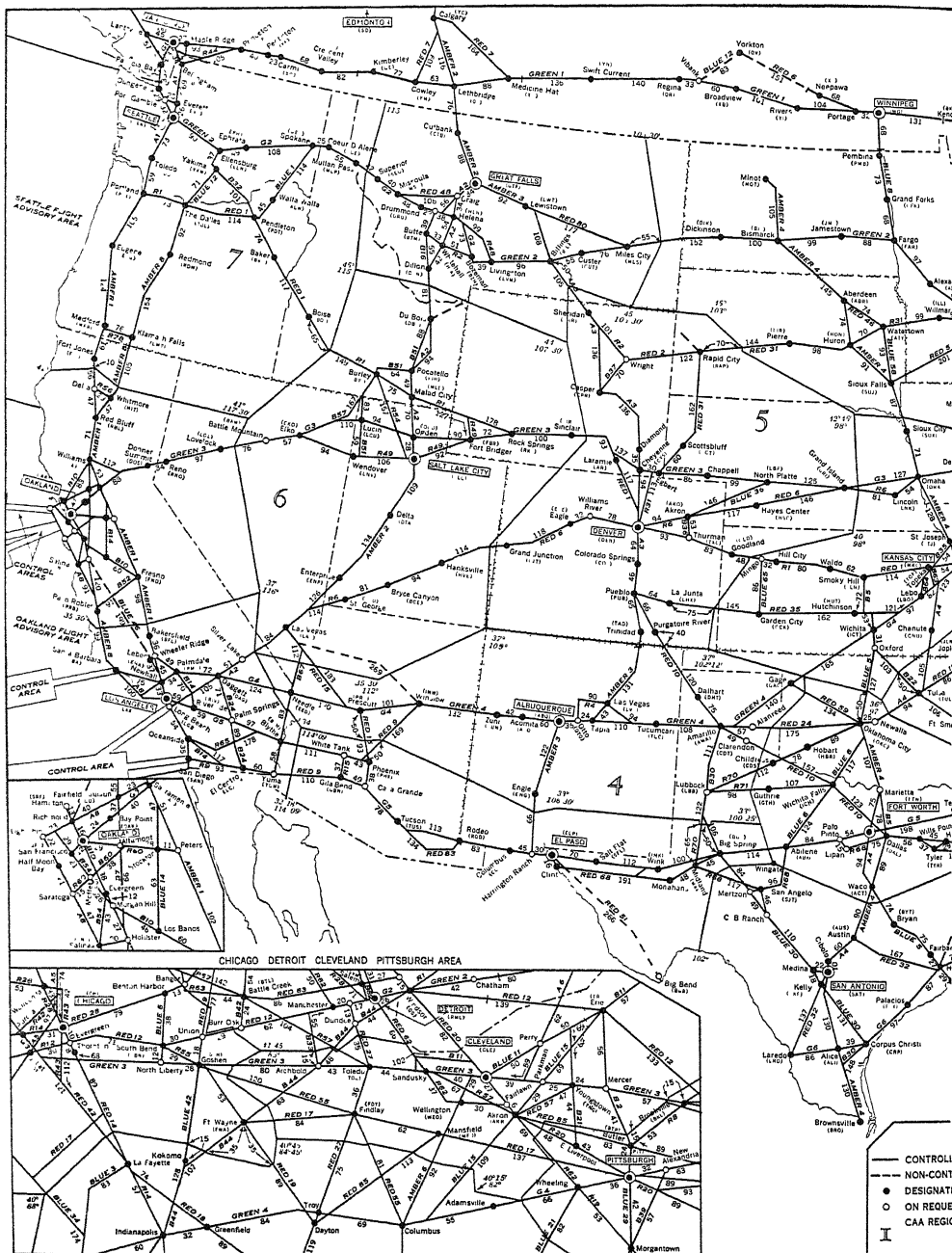
10. Ground transportation franchises for the transportation of passengers between the airport and surrounding areas.

The nonaeronautical concessions provide the balance wheel in the economy of an airport. Where the flying operations might produce enough revenue to cover the costs of operation, it is the various concessions which generally determine whether the airport will operate at a profit. It is considered essential that nonaeronautical concessions be developed fully because they not only bring in added revenue but also stimulate interest in the various aeronautical activities dependent upon public support.

In this phase of airport operation, as in many of the other phases, no particular uniformity has been reached in adopting policies concerning concessions. In deciding which concessions are to be established, the principles of sound business must be followed since many concessions, which might be successful on some airports, would prove to be failures on others. Revenue from concessions depends largely upon the locality and accessibility of the airport to the community it serves, on the size and attractiveness of the airport, and on its service and its ability to produce patronage as well as other factors.

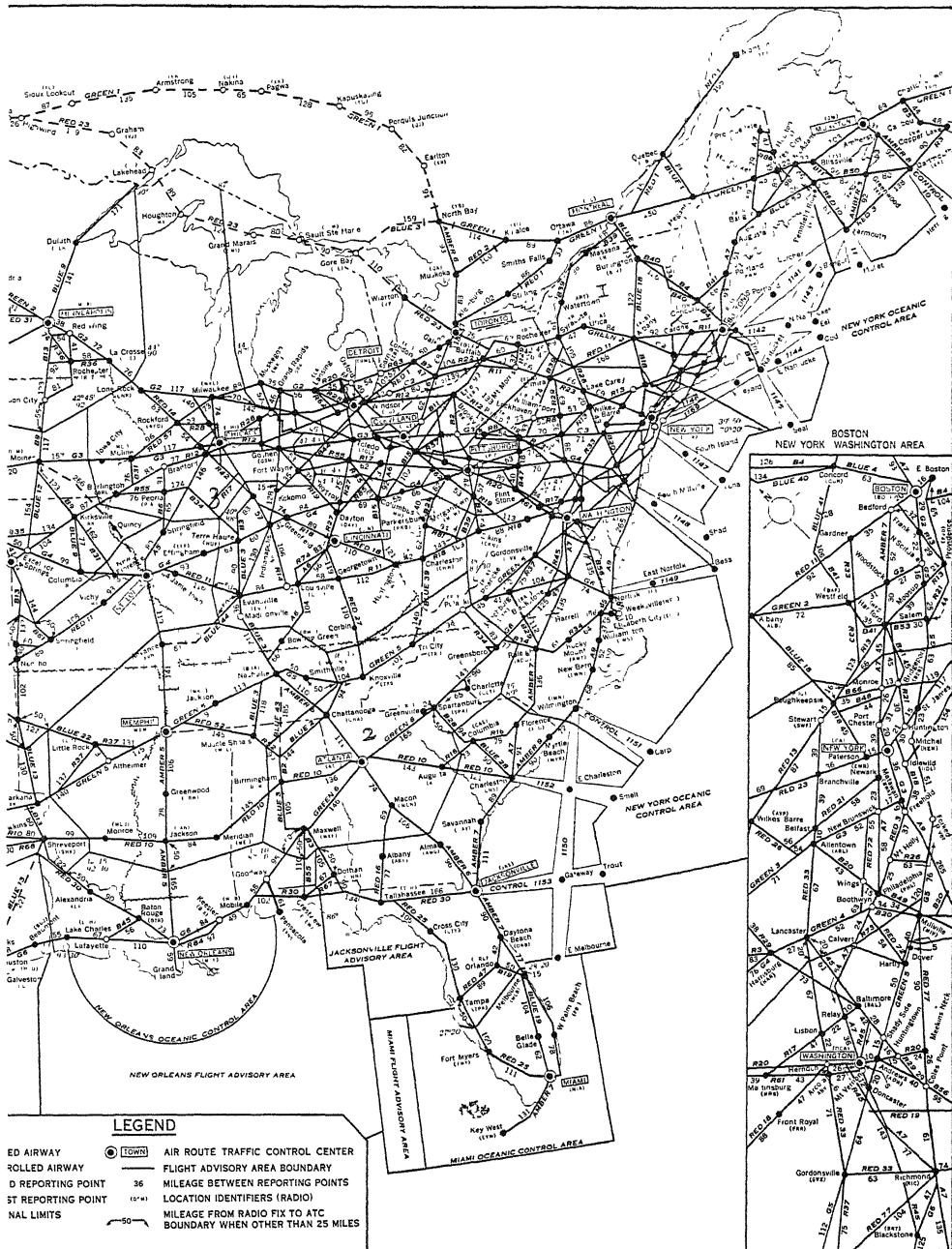
Airways

An "airway" is a path, provided with communications facilities, through the navigable air space identified by an area on the surface of the earth. In the United States, airways are designated or approved by the Administrator of Civil Aeronautics as suitable for air commerce by naming points on the earth and connecting them by straight lines. The airway extends five miles on either side of these center lines and includes all of the navigable air space above this area. Airways are designated by color and number. The colors are green, amber, red, and blue and indicate general direction. Green is main east-west, amber is main north-south, red is supplemental east-west, and blue



Source: U.S. Coast and Geodetic Survey

FIG. 17. Civil Airways and Mileage chart.



supplemental north-south. Numbers begin at the Canadian border and Pacific Coast and work south and east. The width of the airways as shown on the map (Fig. 17) is drawn to an exaggerated scale.

In addition to the colored airways, the Civil Aeronautics Administration now designates "V" or Victor Airways. These are made possible with the installation of very high-frequency, omnidirectional range equipment (VOR) on the airways. In 1954, there were 64,995 miles of Victor Airways available for use.

The airway system of the United States, as provided by the government for the use of military, commercial, and private aircraft, has constantly expanded, until today practically all the major centers of population in the country are served by fully equipped routes. The components of the system have been improved and changed as time has passed, so that the system as a whole embodies the technical advances made in electronic devices in an endeavor to meet the requirements imposed by constantly increasing traffic. Table 7 shows this growth from 1926, when there were but 2,041 miles of airways implemented by the Civil Aeronautics Administration, to 1954, when there were 69,359 miles.

Construction and operation of airways in this country, prior to 1926, was in the hands of the military and of the Post Office Department. Subsequent to that time, although certain sections of airways were constructed by two states (Pennsylvania and Michigan) and by some air carriers, the major portion of the system was constructed and operated by the federal government through the Civil Aeronautics Administration. All of the state and privately constructed airway facilities have now been acquired by the federal government, and at present the Civil Aeronautics Administration operates the entire federal airways system of the United States with the exception of certain military facilities operated in conjunction with military airfields. The basis for this activity of the federal government has been stated as follows:

Several important reasons seem to have determined that the Federal Government should assume the major responsibility for establishing and maintaining the airways system. Difficulties were encountered in the early developmental period in obtaining air-mail contractors for the transcontinental routes if the operators were expected to assume the costs of required aids to safe air navigation. Moreover, if private operators had installed and maintained their own aids to navigation, the use of such facilities might have been restricted largely to the owners. Under such circumstances, military, private, and charter planes would not have had full access to navigation facilities, except through complex joint-use agreements or by providing their own facilities, which

TABLE 7
FEDERAL AIRWAYS SYSTEM, 1926-54

CALENDAR YEAR (AS OF DECEMBER 31)	MILES OF CONTROLLED CIVIL AIRWAYS	RADIO RANGE STATIONS	NON- DIREC- TIONAL RADIO BEACONS	FEDERALLY OPERATED TRAFFIC CONTROL FACILITIES		INTERSTATE AIRWAYS COMMUNI- CATION STATIONS
				Airport towers	Airways centers	
1926.	2,041		.....	.....	.....	....
1927	4,468		.....		
1928.	6,988		.....		
1929.	12,448	9	.....		
1930	15,258	33	6			
1931	17,152	47	46			
1932	19,500	68	74			
1933	18,655	94	77			.....
1934.	19,081	112	73			205
1935.	22,012	137	57			206
1936.	22,245	146	57		....	203
1937.	22,319	180	55		8	245
1938.	23,723	215	50		8	286
1939.	27,074	244	44		11	321
1940.	32,100	292	48		11	365
1941.	36,062	331	48		14	413
1942.	38,498	311	40	61	23	430
1943.	41,506	329	63	101	25	408
1944.	42,549	342	84	104	28	439
1945.	43,285	360	88	107	29	438
1946.	43,403	414	74	115	29	397
1947.	45,393	465	81	134	31	403
1948.	57,368	709	98	150	30	437
1949.	61,392	748	120	162	30	464
1950.	70,253	749	141	172	31	451
1951.	74,424	760	152	157	31	427
1952.	*72,328	760	166	141	31	415
1953.	*72,097	760	181	116	31	395
1954.	*69,359	749	170	104	31	376

*Not including direct VOR airways.
Source: CAA, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954). 1954 figures from CAA.

would have resulted in uneconomical duplications. For these reasons, and because of the paramount public interest in safety of flying operations, a centralized and integrated system of control has been deemed imperative.¹⁴

*Airway and Airport Traffic Control*¹⁵

As air transportation grew in volume, the problem arose of preventing collision between, and expediting the movement of, aircraft

¹⁴ Board of Investigation and Research, *Public Aids to Domestic Transportation* (House Doc. No. 59, 79th Cong., 1st session) (1944), p. 466.

¹⁵ See Civil Aeronautics Administration, *Study of Air Traffic Control* (Washington, D.C., 1943); Glen A. Gilbert, *Air Traffic Control* (Chicago: Ziff-Davis Publishing Co., 1945); Frederick, *op. cit.*, chap. ix; Civil Aeronautics Administration, *Operation of the Air Traffic Control System* (Washington, D.C., 1953).

flying under conditions of limited or no visibility. Around important terminals the problem became serious when aircraft on the same or converging airways were being navigated in or above clouds by means of instruments; and even under weather conditions permitting pilots to see each other's planes there was no assurance that each would make the right decision to prevent a collision. Separation of air traffic, therefore, had to be provided by a centralized agency.

As air space use by private, civil and military aircraft increased and longer, faster, nonstop flights were inaugurated, the need for control extended further out along the airways from the principal terminals. It became apparent that a unified nationwide control of air traffic was needed. The interstate character of the problem pointed to the federal government as the proper authority to handle the matter, and so on July 6, 1936, the Bureau of Air Commerce of the Department of Commerce took over control of air traffic through three centers which had been established by the airlines serving Newark, Cleveland, and Chicago.

The jurisdiction of the first three centers was soon expanded outward to control larger areas; and additional areas, each with its control center, were established as the need arose and funds became available. Today there are thirty-one areas covering the entire United States, in each of which all traffic on the civil airways is controlled from its airway traffic control center under the jurisdiction of the Civil Aeronautics Authority.

Table 8 lists the facilities provided for airway-traffic control. Every airway, however, is not necessarily provided with all these components. For any specific geographic area there is a specialized group of components which provide the federal aeronautical services to the aircraft flying or based within the area.

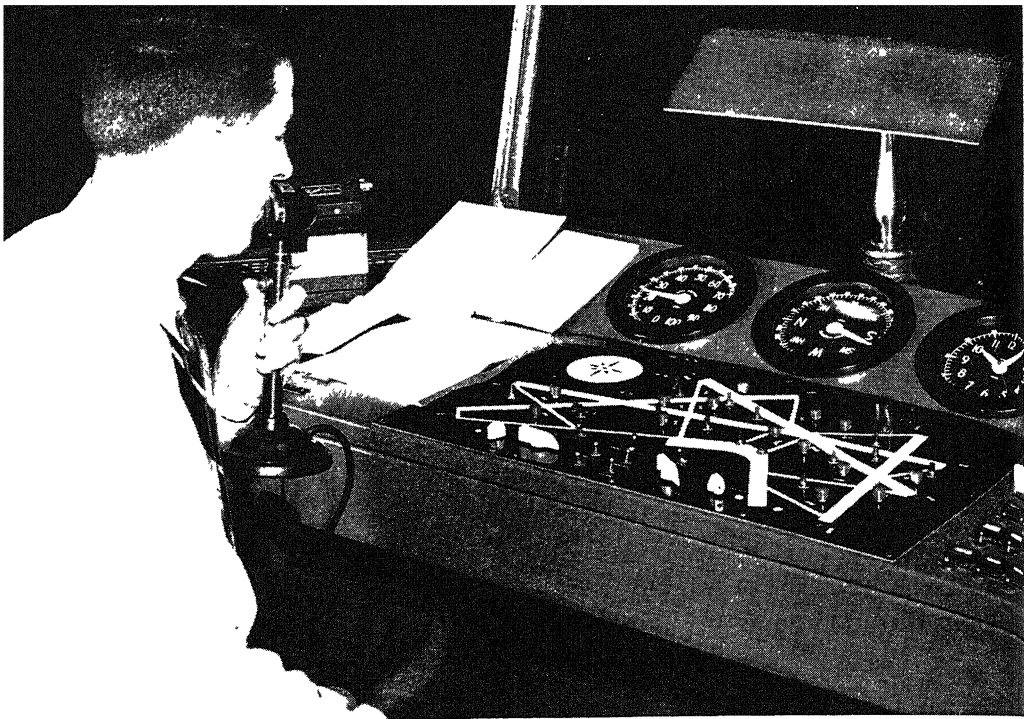
Airport traffic control—that is, control of traffic moving on the ground and departing and landing at airports—antedates control on the airways. The basis of airport control has heretofore been the ability of the aircraft traffic controller to see the aircraft under his control; but with the use of certain radar instruments this is no longer necessary. Airport control was established and maintained by the owners or operators of the airports; but, during World War II, this type of traffic control was taken over by the Civil Aeronautics Administration in order to centralize the control of air traffic under a single agency. Figure 18 shows an installation in an airport control tower.

Table 9 lists the facilities provided for terminal or airport traffic control, but every terminal area does not have all these components.

TABLE 8
FEDERALLY PROVIDED FACILITIES FOR AIRWAY TRAFFIC CONTROL

<i>Name of Component or Facility</i>	<i>Function</i>
Traffic control centers	An Air Route Traffic Control Center (ARTCC) is a facility providing supervision of Instrument Flight Rules (IFR) traffic within a specified control area.
Communications stations	Interstate Airways Communications Stations (INSACS) are capable of radio telephone communications with properly equipped aircraft and monitor the navigational aids along the airway. They have extensive communication links with towers and traffic control centers for relaying messages dealing with air traffic control.
Light beacons	These are rotating beacons regularly spaced along the airways supplemented by directional course lights to indicate certain specified airways; non-rotating lights for field marking, identification, hazard marking and other special purposes.
Intermediate fields	A few of these are provided along the airways for emergency use, chiefly in mountainous areas.
Fan markers	Radio location markers used as radio fixes for air traffic control reporting points.
Homing facilities	Radio beacons installed in en route areas to provide navigational guidance or used to define position reporting points for air traffic control purposes.
L/MF ranges (low and medium frequencies)	Provide courses (frequently called beams or legs) which can be followed by a properly equipped aircraft along the airway. Often arranged to serve both airways and airports. These ranges can be used for voice broadcasts and direct communication with aircraft.
VHF ranges (very high frequencies)	Supply navigational information for aircraft en route. When located on or adjacent to an airport also provide navigational guidance to aircraft during departure or approach and let-down to the airport. These very high-frequency omnidirectional ranges (VOR) are intended to replace the obsolescent L/MF ranges as the basic navigational guidance on the airways.
Distance measuring equipment	This component (DME) is designed to make possible in the aircraft a visual indication of the distance to an aircraft from a ground facility.

The associated aids are added to the basic component, the control tower, as they are needed to meet operational problems peculiar to various levels of instrument weather activity or unusually high-density traffic makes necessary new facilities and procedures.



Courtesy: American Airlines

FIG. 18. An airport control tower operator at night. Directly in front of him are, reading left to right, wind speed indicator, wind direction indicator, and clock. The runway indicator is lighted to show all runways on the field for the purposes of this photograph. Normally, only the one to which he has assigned an incoming or outgoing plane would be lighted on the control panel.

With the placing of airport traffic control under the federal government, it became possible to delegate certain responsibility for the control of air traffic under instrument conditions from an airway traffic control center to an airport traffic control tower. This is a logical extension of the functions of airport traffic control and, in effect, establishes a local "airport traffic control area" (usually an area within a three-mile radius of the control tower) within which all traffic under all weather conditions is under the jurisdiction of the control tower. The airways traffic control center co-ordinates, thru the approach control, the flow of traffic into, and out of the area and over these local areas and along the airways.

Problems of traffic control for aircraft not moving in definite, predetermined flight paths would be almost insurmountable. With their paths crossing almost anywhere, the situation would be similar to that which would arise if a hundred motorcyclists were stationed around the edges of a field and each were allowed to start for any spot on another edge at the same time with speed and direction of his own choice. Neither the drivers nor any size traffic-control force could prevent collisions, even on a bright, clear day.

TABLE 9

FEDERALLY PROVIDED FACILITIES FOR TERMINAL TRAFFIC CONTROL

<i>Name of Component or Facility</i>	<i>Function</i>
Control tower.	Supervises, directs and monitors air traffic within the airport control area.
Approach light lanes.	Neon and high intensity lights to aid pilot during approach and landing.
Fan markers.	Used as radio fixes for air traffic control reporting points.
Instrument landing systems. . . .	Provides pilot with means for precise navigation during approach for landing.
Precision approach radar. . . .	Provides controller with precise information on the position of aircraft during approach.
Airport surveillance radar	Provides controller information on position of aircraft within the terminal area.
Homing facilities.	Radio beacons used for both navigational guidance and as a radio fix for air traffic control reporting point in the terminal area.
Combined station-tower	Combines functions of both tower and interstate airways communications station.
Airport beacon	Green in color indicates lighted airport. Amber indicates seaplane base. Split beam indicates military facility.
Distance measuring equipment. . .	A visual indication of distance from airport.

Traffic between terminals is therefore controlled only on the airways. It cannot be controlled like surface traffic, which is stopped by a red light. Aircraft must remain in motion at sufficient speed to maintain altitude and maneuverability. Such traffic is controlled, therefore, by advance planning. Airway traffic control anticipates and so organizes the movement of aircraft in advance that no danger of collision can arise if they proceed in accordance with instructions.

At airports there arises a combination of *surface* and *air* traffic to be kept separated. Airport traffic control provides this separation for taxiing, landing, and departing aircraft. Control of aircraft moving on the ground is particularly important, since aircraft are designed so the pilot has maximum visibility while in flight; but while on the ground the pilot's visibility is often obstructed by the motor and wings, making it quite difficult to see other aircraft and obstructions quickly enough to avoid collisions.

Providing safety, while the fundamental purpose of air traffic control, is not its only purpose. Although safety comes first, just as important a purpose, from the standpoint of air transportation, is the expeditious movement of traffic.

If commercial air transportation is to be widely used, it must maintain its advertised schedules within reasonable limits. Failure to maintain schedules has definitely hampered the development of air transportation. Delays encountered en route also cause a definitely measurable loss. Every excess minute spent in the air means just so much monetary loss for fuel, wear and tear, and other expenses.

Air traffic control must, therefore, be designed to keep traffic flowing evenly and with as little delay as possible. Only an agency having information on all traffic would be able to do this with safety. With the complete picture available, it is able to make the best possible arrangements to prevent delay along the way or in landing.

Adequacy of Airways and Traffic Control

Our system of airways and traffic control has been entirely inadequate for some years. It costs about \$65 million to operate annually but can only handle about half of its air traffic potential. This is because:

1. The navigational information provided the pilot is still relatively crude and inaccurate and the required operational accuracy can be attained only by channelizing all aircraft over definite spot fixes. Under this system, safe, reasonable, lateral separation is not possible.

2. Concentrating aircraft within single vertical walls, or "boxes" (Fig. 19), is an extremely inefficient use of the available air space and needlessly introduces serious collision hazards. Neither the pilot nor the traffic control agency, which receives its information from pilot position-reporting, has exact continuous knowledge of the plane's position laterally or horizontally in this airway.

3. Safety is insured at present by requiring the traffic-control system to apply such large tolerances in estimating plane positions and in issuing clearances that low traffic densities result on the airways. The necessity in recent years for integrating high speed jet-type aircraft with conventional types has compounded the inefficient use of air space. (Fig. 19 reflects separation vertically and horizontally.) This problem is greatly intensified in congested approach areas sur-

rounding airports, where climbing, descending, and stacking (Fig. 20) of aircraft of varying speeds introduce further complications.

4. The communication system attendant to the present air navigation system must necessarily be greatly burdened by the considerable message traffic required for position-reporting and for traffic-flow control of the channelized aircraft. In fact, when the system begins to overload, the first breakdowns often occur in communications between the ground and planes in the air.

5. Even with the average maximum load on our present system, we frequently operate close to the breakdown point of the human traffic

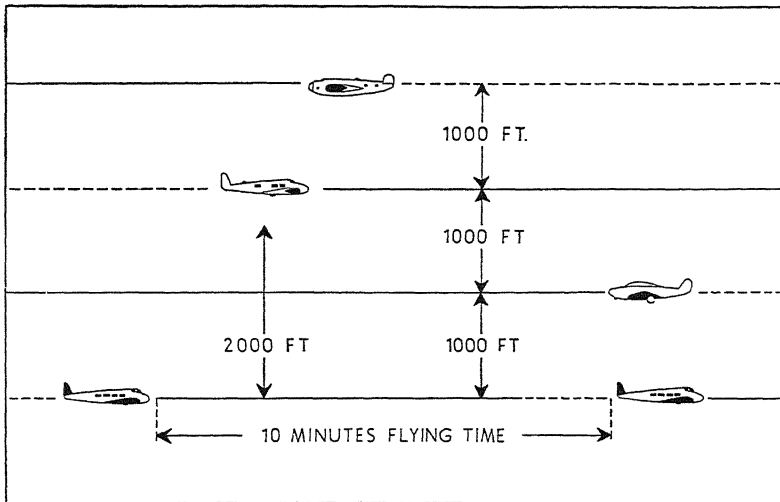
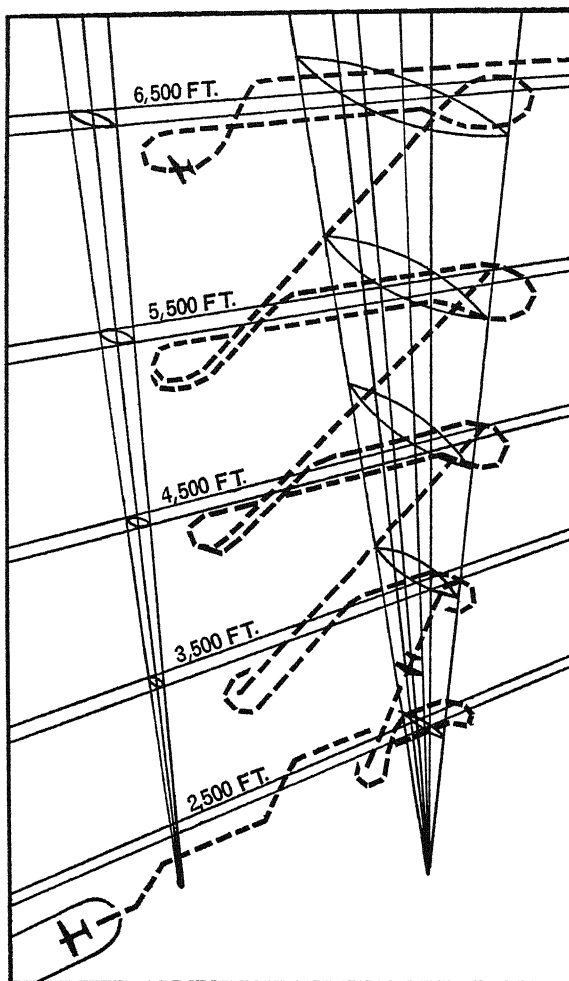


FIG. 19. Vertical and time separation on an airway.

controller. Experience has shown, moreover, that the addition of more controllers gives only a fraction of the expected proportionate improvement, because as soon as extra controllers are involved there is the problem of interchanging information between them, so that the whole process may sometimes actually be slowed down rather than speeded up. When a human controller is delegated the responsibility of maintaining aircraft separation, as he is today, he must not and does not allow anything to interfere with that function; efficiency must come second to safety, and the tools are inadequate to maintain both safety and efficiency at a high level. The result is often serious delay or even an accident. Many persons in the airline industry believe that it is too much to ask any human or group of humans to take



Courtesy: Baltimore Sun

FIG. 20. Stack over an airport. In bad weather, aircraft are stacked over marker beacons near airports in this manner. Starting at the top of the stack, a plane works down as the pilot does a series of turns at each altitude until ordered lower and then finally lands.

the responsibility for maintaining safe separation of aircraft in instrument weather. Rather they believe that the human function should be to guide an infallible machine.¹⁶

¹⁶ W. E. Rhodes and George Comstock, "A Quantitative Approach to All-Weather Flying," an address presented to the S.A.E. National Air Transport Engineering Meeting, 1946; R. S. Damon, "What the Airlines Want in Navigation Aids," an address presented to the Institute of Aeronautical Sciences, 1949; Air Coordinating Committee, *Air Traffic Control and the National Security* (Washington, D.C., 1950); International Air Transport Association, *Final Approach and Landing* (Montreal, Canada, 1952).

Under conditions of air traffic control that have existed during the past few years, our airspace has been actually shrinking because newer aircraft make such an extravagant use of it. For example, a modern commercial airplane covers the 205 miles between Washington and New York in not more than 75 minutes, including maneuvering in the terminal area. Under the present requirement of ten-minutes separation between aircraft traveling at the same altitude, a block of airspace almost 30 miles long would have to be reserved for this airliner during instrument flight conditions. This would limit occupancy of the altitude used by this flight, all the way from Washington to New York, to a total of only six aircraft. It is necessary to provide such a big "box" of air for each airplane, because under present conditions neither pilot nor controller can pinpoint the airplane's position with sufficient accuracy to allow a narrower margin of safety, and because the Civil Aeronautics Administration traffic-control center for en-route traffic does not have direct communications with pilots much beyond the terminal area.

Not until air carriers can operate over a system of automatically controlled, electronic, all-weather airways can they hope to offer the reliability and safety necessary to assure profitable operations. The ultimate goal of our system of airways and our air traffic control should, therefore, be safe, reliable operation of quantities of aircraft under all conditions of weather. The airlines can now maintain almost faultless schedules under visual flight regulations (VFR) or marginal instrument flight regulations (IFR) weather. Single planes can be flown under almost zero-zero conditions, and huge fleets of aircraft can be operated in clear weather. Some of these things can be done even in relatively bad weather, but we are not yet able to do all of these things in all kinds of weather.

The Common System of Air Traffic Control

Because of developments in the use of radar and other electronic devices as air navigation aids during World War II, it was thought that safe and reliable all-weather flying would be developed very rapidly after the close of hostilities. Unfortunately, however, valuable time has been lost because of a dispute about the system or systems to be used which still continues between the Army, Air Force, Navy, Civil Aeronautics Administration, and airlines.¹⁷

¹⁷ See *Aids to Air Navigation and Landing* (House Report No. 885, 80th Cong., 1st sess. (Washington, D.C., 1947) ; Air Coordinating Committee, *Air Traffic Control and the National Security* (Washington, D.C., 1950).

In the ultimate system of air traffic control and navigation, as envisioned by both military and civil agencies, the airways must be truly operated and controlled by a "common civil-military system" fully automatic in operation. This system must provide: (a) private line communications; (b) an identification system; (c) en route navigation and control; (d) a system for transition from the airways to (e) a precision approach and landing system; and (f) airport control after landing. All of these facilities must be electronic or mechanical in nature wherein the human element is eliminated except for monitor or emergency purposes. Under this plan it will be possible for a pilot to transmit, through automatic means, a request from his destination to proceed and arrive at or about a specified time. This request will be processed automatically by "time utilization" equipment which assigns available time and air space to the flight, at the same time preventing any conflicting assignment from being made to another aircraft.

After clearance is granted, the pilot, in communication with the ground control agency through private-line air-ground radio which cycles out all other traffic, will receive taxi, take-off, and en-route instructions by means of visual indicators in the cockpit of the plane. These show directions such as "proceed," "hold," "climb," "descend," "turn right," "turn left," etc. Whenever the pilot deviates from his assignment or meets a situation calling for revised clearance, the proposed ground equipment will automatically instruct him at any time from before take-off until after landing.

A pilot's position en route and in an approach area will be checked both by his automatic course computer and altimeter in the aircraft, and by ground equipment which will periodically interrogate the plane, identify it, and read its position in the controlled air space. The ground controller, in addition to sending automatic position corrections to the flight, will have a pictorial display of the entire control area, including runways and taxiways on the airport itself.

Charges for Airway Use¹⁸

Airways and traffic-control facilities have been supplied and operated wholly at federal expense. In 1952 it was estimated by the Civil

¹⁸ See Civil Aeronautics Administration, *Charging for Federal Airways Services* (Washington, D.C., 1946); International Civil Aviation Organization, *Preliminary Study of Payment for the Use of Airway Facilities* (Montreal, 1949); Civil Aeronautics Administration, *A Program of Charges for the Use of The Federal Airways System* (Washington, D.C., 1953).

Aeronautics Administration (which, under the Civil Aeronautics Act of 1938, has the responsibility to provide and operate the federal airways system) that we had invested \$125,478,666 in our airways with a then current value of \$85,305,959. In the same year it cost \$75,-693,091 to amortize and pay interest on, develop, maintain, operate, and manage the federal airways system. Recently there has been some question whether such expenditures can be justified without an attempt being made to recover a substantial part of them from users. Since there are a number of different types of airway users, the problem is to allocate costs among them according to the responsibility of each group.

TABLE 10
USE OF AIRWAY FACILITIES, 1952

Facility Used	Scheduled Air Carriers (Per Cent)	All Other Civil (Per Cent)	Military (Per Cent)
Airport traffic control towers	30.9	50.2	13.9
Instrument approaches	79.3	6.4	14.3
Instrument landing system	93.3	4.5	2.2
Ground controlled approaches	54.1	10.9	35.0
Airport surveillance radar	56.9	33.7	9.4
En-route control (fix postings)	61.6	7.8	30.6
Radio contacts with CAA communi- cations stations	10.0	36.9	53.1

Source. CAA, *A Program of Changes for the Use of the Federal Airways System* (Washington, D.C., 1953).

While there are a number of recognized methods of allocating costs, the one which seems most appropriate for the federal airways is that known as the "unit-of-use method." The basic premise of this theory is that the annual cost of the airways facilities and services can be allocated in proportion to the relative use of the system by the various user-groups. Table 10 shows the use of airways facilities by the chief user-groups during 1952. The simplest method of allocation, which figures costs in direct proportion to the number of units-of-use consumed, operates on the assumption that each such unit has an equivalent effect on the costs of providing the aids and services. On this basis, the distribution of the cost responsibility for en-route control, for example, would be directly proportionate to the number of fix postings made by each class of user.

The "units-of-use method" is not a suitable measure by itself, however, since it fails to account for the economic value derived from the airways by the various user-groups. It assumes, for example, that use

by an aircraft carrying one passenger on a flight is the same as that of one carrying 60 passengers. In order to take into account this value-concept and to provide a more equitable allocation of cost, it is necessary, in cases where the value of a unit-of-use is measurably greater for one user-class than for another, to draw a distinction between the various users. Under this concept the cost charged against each group is in proportion to the value they get from the service. This method recognizes that the small aircraft owner should not be expected to pay the same rates as the commercial aircraft operator, and that the needs of the commercial air carriers have largely determined the scope of our airways system.

In allocating the total cost of the airways system, the Civil Aeronautics Administration first deducts the cost attributable to military use from the total costs of the system. They do not propose to levy user-charges on the military, but merely determine their cost responsibility.¹⁹ The Administration must then estimate the economic value derived by the civil users on a comparable basis, and finally reduce it to a monetary value by means of a yardstick common to all aircraft and aircraft operators.

The best yardstick or common denominator for the civil user-groups appeared to be the gross take-off weight of the aircraft used. The Civil Aeronautics Administration calculated an average weight for the aircraft operated by the scheduled air carriers and other civil flyers, using the number of plane-miles flown by each type of aircraft in 1952. The gross take-off weight of the average scheduled air carrier aircraft was found to be 62,800 pounds, while the corresponding figure for the average aircraft in the other civil group was 3,000 pounds, a ratio of approximately 12 to 1. These weights were then applied to the utilization statistics shown in Table 10 for each of the major airways components.

¹⁹ This concept is opposed by the Air Transport Association, which maintains that the military should carry its share of the support of the federal airways system and if necessary should make direct cash payments for their part of the annual cost. This group also maintains that at least 30 per cent of the annual cost of the airway system should be assigned to military stand-by value before any costs are assigned to aircraft operators on the basis of actual use of the system. Military stand-by value represents, in the eyes of the airlines, the special national-defense value of the system over and above value represented by current military traffic. These values include the use of the airways radar and communications network in the continental air defense system, and the ability of the military to clear immediately all civil air traffic from the system and to operate freely military and Civil Reserve Air Fleet aircraft over any part of the United States. The Civil Aeronautics Administration rejects the concept of military stand-by value, holding that the airways system is by no means unique in contributing to the national security and that in modern total war all of our resources and industries, including the entire transportation system, become instruments of national defense which are at the disposal of the military services.

Comparison of the various cost allocations resulting from the Civil Aeronautics Administration studies show a wide range in the estimated share of both the scheduled air carriers and the other civil operators. These are shown in Table 11. According to the CAA, neither the allocation which is proportionate to the estimated costs attributable to each user-group nor that based on the value principle provides a realistic basis for determining the cost responsibility of the airway users. As has been mentioned, the allocation based on cost does not differentiate between types of aircraft and disregards the value-received and ability-to-pay principles. Recovery of costs on this basis places an unduly heavy burden on civil aviation activities other

TABLE 11
SHARE OF COSTS OF FEDERAL AIRWAYS SYSTEM

Type of User	Based on Costs Attributable to Each User-Group (Per Cent)	Based on Eco- nomic Value Derived by Each User-Group (Per Cent)	Assigned by CAA (Per Cent)
Scheduled air carrier.....	39.2	62.3	50.7
All other civil	27.0	3.9	15.5
Military	33.8	33.8	33.8
	100.0	100.0	100.0

Source: CAA, *A Program of Charges for the Use of the Federal Airways System* (Washington, D.C., 1953).

than those of the scheduled airlines, and its application would undoubtedly have a detrimental effect on the development and growth of private flying and other general aviation activities. On the other hand, it does not appear feasible to place complete reliance on the value concept. Value derived is a fairly intangible concept which cannot be determined as precisely as costs. Moreover, since the airways are, for all practical purposes, a government monopoly and must be utilized by the civil aircraft operators, there is actually no real commercial test of what charges the traffic will bear.

Since the purpose of a program of user-charges for the federal airways system is merely to recover the cost of providing the aids and services, without intending to make a profit, the CAA proposes that the allocations on the basis of cost and economic value be used respectively as the upper and lower limits of the cost responsibility of the two civil user-groups, and that their allocated share be established midway between these two extremes. Such an allocation would, in effect, be based primarily on costs, but would give limited recognition

to the value principle on the grounds that civil aviation (excluding the scheduled airlines) has not yet reached the stage of maturity where it can stand to pay full costs. Under such a system of allocation, the assigned share of the major user-groups would be: scheduled air carriers, 50.7 per cent; other civil operators, 15.5 per cent; and military, 33.8 per cent.

There is considerable doubt that the scheduled airlines have reached a point in their development where they could carry the added financial burden of airways user charges.²⁰ It is feared that this burden will be large enough to severely handicap the industry in attracting the substantial amounts of additional capital required for the major re-equipment programs necessary in the near future. Moreover, only the ten domestic "service mail rate carriers" (see Chapter 8) would, in all probability, be able to absorb the user charge without proportionately increasing the subsidy burden to the government. The remaining carriers would be assessed user charges by the CAA and would later receive a similar amount from the Civil Aeronautics Board in the form of subsidy. As a result, the government as a whole would receive no net benefit from the user charges imposed upon these carriers but would, in fact, incur the net expense of administering the user charge program as applicable to them.

In view of the relatively insecure economic position of the air transport industry at its present stage, it would seem important to approach the problem of user charges with a view to imposing an initial charge at a level that would not handicap seriously the further and continued development of the industry. Even if the other advantages to the economy of a growing air transport industry are disregarded, the sounder long-range business policy, from the standpoint of the government's recovering the largest part of the cost for servicing the airways, may well be to start with a low initial charge and depend upon the industry's growth for increasing government receipts for user charges.²¹ In any event the charging method should provide for an equitable distribution of the burden of airways-system costs among the various users. The alternative methods of charging fall into two broad categories, direct charges and indirect charges.

²⁰ It has been estimated that if user charges of the type proposed by CAA had been in effect in 1952, they would have absorbed 25.1 per cent of the total domestic industry profit, 22.4 per cent of the profit for the Big Four domestic carriers, and 26.7 per cent for other trunks. *CAB Comments on CAA Staff Study on Airways User Charges* (November 25, 1953).

²¹ The CAB reports that the consumption of gasoline by domestic civil air carriers has since 1946 increased 34½ per cent faster than has the cost of maintaining the airways. *Ibid.*

A system of direct charges for the use of specific components and services of the federal airways system would meet several of the broad requirements of an equitable program, since such charges would be directly related to both the use made of, and the benefit derived from, individual facilities and services. However, the operational and administrative problems inherent in a system of direct charges appear to make this method undesirable. By leveling a charge for each time a facility was used, the system might also discourage the use of certain services by operators trying to economize, and thus create a safety hazard. The overriding importance of safety in air transportation would appear to rule out direct charges on this count alone.

There are a number of systems of indirect charges which could be used: (a) an aviation fuel-gallage charge applicable to all domestically operated aircraft and (b) a gross ton-mile charge on large aircraft and a graduated registration fee on light planes. Less desirable methods of determining indirect charges applicable to the large aircraft are: (a) an airplane mileage charge, (b) a revenue ton-mile charge, and (c) a gross revenue charge. Of these the fuel-gallage charge imposed on all aviation gasoline and jet aircraft fuel seems most desirable and is recommended by the CAA as being equitable and simple to administer.

The amount of fuel consumed by an aircraft is roughly proportionate to its size and the distance it travels. Thus, assuming that on most flights an aircraft is an actual or potential user of the federal airways, the amount of gasoline consumed would be an indirect measure of both the use made of these facilities and the benefits derived from them. The major impact of this type of charge would fall on the commercial air carriers, which are both the prime users and the greatest beneficiaries of the airways system. They consumed approximately 550 million gallons of aviation gasoline in 1952. The burden on other civil aviation, which consumed approximately 130 million gallons of aviation gasoline in 1952, would be considerably lighter. The nature of the charge would thus insure an equitable distribution among the operators of large and small aircraft.

In 1954, the Air Coordinating Committee (see Chapter 4) in its report to the President²² made the following recommendation:

Since a large segment of United States domestic civil aviation has reached a level of economic maturity which would permit it to make a reasonable

²² Air Coordinating Committee, *Civil Air Policy* (Washington, D.C., 1954).

contribution toward meeting the costs of the airways system, active consideration should be given to the inauguration of a program of domestic airway user charges. However, charges for the use of Federal airways system and other federally-provided facilities and services used by civil aviation should be treated as a part of a comprehensive policy of charges for the use of all federally-provided transportation facilities and services, taking into account Federal grants-in-aid programs.

If the above is adopted as our national policy on airways user charges, as seems likely and charges for use of federally aided highways and federally constructed waterways are added to the picture, it is doubtful that user charges will soon be levied or paid.

Chapter

3 * COMMERCIAL AIR CARRIERS

THE START of air transportation in the United States grew out of what has been called "the spontaneous attraction of the airplane and the Post Office for one another."¹ The carriage of passengers and cargo on a regular schedule by air had been considered for a number of years and had even taken place from time to time in an irregular fashion; but all such activities were decidedly speculative, and the idea of flying the mail seemed to meet with public acceptance more readily than the carriage of passengers.² Safety was not a controlling factor in mail transportation; and such service was an accepted function of the government, so that a subsidy could be obtained to carry out the developmental work. This being the case, commercial operators did not have to rely on profits at the start.

Early Post Office Activities

In 1911, the Post Office Department displayed an interest in air transportation. A few sacks of mail were carried on the first flight of mail from Nassau to Mineola, Long Island, in September of that year, and 31 such flights were made in the year following. The department made several attempts to obtain federal appropriations for airmail, beginning in 1912, but met with no success until 1916,³ when

¹ E. P. Warner, *The Early History of Air Transportation* (Northfield, Vt.: Norwich University, 1938), p. 3.

² The first of the early regularly scheduled passenger-carrying organizations was the St. Petersburg-Tampa Airboat Line. It was started in January, 1914, and lasted for three months. The most optimistic attempt was made in 1916, when the American Trans-Oceanic Company was formed for the purpose of flying the Atlantic Ocean on regular schedules. The most enduring early attempt at scheduled passenger operation was that of the Aero Limited Company organized on July 26, 1919. This company operated between New York City and Atlantic City in the summer and between Key West and Cuba in the winter. This company continued, until 1924, to be the outstanding air carrier in the United States.

³ Under this small appropriation, the Post Office Department advertised for bids on proposed air mail routes in Alaska and between New Bedford and Nantucket, Massachusetts; but there were no acceptable bidders. It is interesting to note that these advertisements called for service to out-of-the-way places.

an experimental appropriation was made. In the following year another appropriation was made for experimental service and also for the purchase, operation, and maintenance of "aeroplanes." With the funds so provided, air mail service between New York and Washington was begun on May 15, 1918. The air transport part of the operation was at first conducted by the War Department, which provided airplanes and personnel; but on August 12, 1918, the Post Office Department took over the operation with its own equipment and personnel. Service was inaugurated between New York and Chicago in 1919 and was extended from Chicago to San Francisco during 1920, in which year the Chicago-St. Louis and Chicago-Minneapolis routes were also opened.

Until 1924, air mail route operation was limited to daylight flying; but, in July of that year, night service began on the portion of the transcontinental route west of Chicago and a year later between New York and Chicago, after the solution of difficult problems of airway construction through the Allegheny Mountains. The completion of a night airway system from coast to coast was one of the Post Office Department's greatest contributions to commercial air transportation.

The importance of this transcontinental night and day air mail route cannot be overemphasized. It stimulated manufacturers to build planes adapted for night flying, and the regular air mail service over so long a distance made the public realize that letters sent through the air arrived safely and promptly and that great amounts of time could be saved by using air mail. The service on this route achieved an international reputation for its regularity, comparatively few accidents, and other achievements. It brought air transportation closer to the public as a practical reality.

By 1925 the development work of the government service had reached the point where private operation of an air transport service and the retirement of the government from the operation phases of air mail transportation seemed feasible. Legislation providing for service by contract carriers accordingly was provided by the Air Mail (Kelly) Act of February 2, 1925. Some time elapsed, however, before it was possible to place the first contract service in operation, and it was not until 1926 that a number of contract routes were opened. Private carriers soon were able to demonstrate a considerable degree of operating success, and plans were therefore made for the liquidation of the government air mail transport service. The Chicago-San Francisco section of the transcontinental route was turned over to

Boeing Air Transport on July 1, 1927; and the New York–Chicago section to National Air Transport on September 1, 1927.

The Beginning of Commercial Operation

Although commercial operation of air transport services received its first impetus from the letting of air mail contracts, the passage of the Air Commerce Act of 1926 distinctly encouraged it. (See Chapter 4.) Then came the flight across the Atlantic Ocean by Charles A. Lindbergh and other spectacular flights of the year 1927, increasing the public's interest in flying and doing much to make it possible to finance the beginnings of an air transport industry in this country. Improvements in equipment and further development of auxiliary facilities also contributed to the development of the industry, so that during 1928 and 1929 a veritable air transportation boom took place. The security markets of the period were favorable to new financing; the technical progress of aviation had been demonstrated by spectacular long-distance flights; and the earlier air mail carriers with favorable routes were obtaining large profits after the reduction of postage rates in 1928 stimulated volume. Transportation companies became a new division of the aviation industry, starting under the control and patronage of the same groups that had been interested in the manufacturing companies and had waited for increased government appropriations for air mail before entering the industry.⁴ There is little doubt that the intense cultivation of aviation in the 1927–29 period was due to the increasing possibilities of profits sensed by financial interests. Certainly, air transportation had not yet found an economic function that would cause the sudden interest of financiers; nor was this interest a result of the fact that financial interests had awakened to the future possibilities of air transportation, for “pioneering had always been carried on by individuals or by the government, not by the financiers.”⁵ Possibilities of profits arose in the form of air mail pay to air transport organizations⁶ and also from the

⁴ E. E. Freudenthal, *The Aviation Business* (New York: Vanguard Press, 1940), p. 79; J. H. Hamstra, “Two Decades—Federal Aero-Regulation in Perspective,” *Journal of Air Law and Commerce*, April, 1941, pp. 108–20.

⁵ Freudenthal, *op. cit.*, p. 98.

⁶ In the period 1927–28, many airline executives did not want to bother with passenger traffic, so that its development was entirely incidental to the real business of carrying the mail. Operators, however, were forced to recognize the demand for passenger service created by the establishment of scheduled routes, but the following is typical of airline passenger regulations of that time. “Between New York and Chicago, Passenger tickets restricted as follows: (1) One passenger per trip, provided there is no interference

fact that at this time huge profits could be made on stock issues. Huge holding companies were formed, controlling manufacturing and operating companies at the same time.⁷

There were also other motives which caused certain individuals and organizations to put capital into air transportation between 1927 and 1929. These may be summarized as follows: (1) There were intercity jealousies, one city wanting just as good or better air service than another. (2) Control over a future competitor was desired, as, for example, when a railroad company put money into an airline. (3) Wealthy individuals, who combined an enthusiasm for this new means of transportation with a desire to make their community or region a leader in air transportation, sometimes contributed capital to a new airline with the thought that if it was lost they would not miss it and if it were not they would be "in on the ground floor" with a new investment medium. (4) As airlines became more numerous and consolidations developed nationwide operations, additional capital was sometimes made available by the companies themselves for added facilities to fend off competition. (5) New capital was made available at times to permit some of the already established through lines to add connecting links between certain points in order to strengthen their operations from a sales standpoint. (6) Towns and cities which wanted to be included in an airline system appealed not only to the pride of their wealthy citizens but also to their influential politicians. This accounted for the establishment of a number of short lines, because the politicians involved persuaded others to contribute capital on the promise of a lucrative government mail contract. In the case of most of the principal lines, however, it is doubtful whether the politicians did much more than add slightly to the already powerful motives.⁸

The history of scheduled air transportation is replete with the small airlines which sprang up almost over night, operated for a few months, and then ceased, usually going into bankruptcy. There was

with mail or express to be carried. (2) At any point en route the pilot has the authority to replace a passenger with mail or express or to decline further passage based on weather data concerning the flight." See A. E. Blomquist, *Outline of Air Transport Practice* (New York: Pitman Publishing Corp., 1941), p. 17.

⁷ The chief groups dominating the whole industry, manufacturing and transportation, from 1927 to 1934 were General Motors-North American Aviation Group, Curtiss-Wright Corporation, United Aircraft and Transport Corporation, and Aviation Corporation of Delaware. For an account of their financial and other operations, see Freudenthal, *op. cit.*, chap. v.

⁸ See K. T. Healy, *The Economics of Transportation in America* (New York: Ronald Press Co., 1940), pp. 124-25, for a discussion based on Congressional hearings.

nothing rational about the development of air transportation in this country. Investors and others believed that the industry was developing rapidly and that it would show large profits, but many of these optimists lost money.

There were 38 airlines existing during 1929. New companies brought the total operating lines up to 43 in 1930, out of which four discontinued operations before the end of that year.

The primary reason for the passage of the Watres Act of 1930 (see Chapter 8) was to avoid unprofitable operation of mail and passenger lines, because, even with the large increase in mail poundage which came about in 1929, many mail contractors were operating at a loss. Passenger rates were too low for airlines to make money from this traffic; and whenever these rates were increased, passenger travel fell off sharply. Various passenger-carrying airlines had entered the business hoping to establish themselves and absorb their losses until they could obtain mail contracts.

Organization of Air Transport Industry, 1930-34

The Watres Act of 1930 provided that the Postmaster General unify the air transportation industry, and in the two years following he accomplished this unification among the air mail carriers. Under his direction, by awarding mail contracts without competitive bidding, which did not enable many companies to qualify, and by granting extensions many times longer than the original mail routes, the air transport system assumed the major characteristics it has today. There were three transcontinental lines organized from the mass of shorter passenger and mail carriers.⁹ Several of the small passenger-carrying airlines which tried to obtain mail contracts at this time were forced into consolidation with the larger airlines.

The total number of airlines dropped from 43 in 1930 to 32 in 1932. This figure does not, however, accurately measure the extent of consolidation and abandonment of airlines, for all during this

⁹ United Air Lines Transport Corporation (later United Airlines) obtained the northern route through the welding together of its four operating divisions—Boeing Air Transport, Pacific Air Transport, National Air Transport, and Varney Airlines. American Airways (later American Airlines) obtained the southern transcontinental route through its operating divisions—many small airlines—which had previously gone under the names of Universal Division, Colonial Division, Southern Division, and Embry-Riddle Division. Transcontinental and Western Air, formed by a combination of some of the routes of Western Air Express and Transcontinental Air Transport—Maddux, put into operation the middle transcontinental route. Eastern Air Transport (later Eastern Air Lines) operated in the territory of the present company on the Atlantic coast. Northwest Airways operated in the same locality as the present Northwest Airlines, and Western Air Express (later Western Air Lines) operated on the Pacific Coast and in the western states.

period new passenger routes were being placed into operation. Not including the carriers that changed their names during this time, there were 19 airlines which began operations in 1930, 15 in 1931, and 9 in 1932. Of the nine carriers beginning operation in 1932, three discontinued operations before December 31 of that year, and two more shortly after the beginning of 1933.

From 1930 to 1934, improvements and even radical changes in flying equipment and operating methods enabled more and more satisfactory service—better co-ordinated, faster, and more comfortable—and better maintenance of schedules. At the same time, there were decided developments in airways, airports, weather reporting services, and other aids to air transportation. The flying equipment itself was not, however, standardized as to type or as to utilization of specific types in specific services.¹⁰

The Air Transport Industry from 1934 to the Civil Aeronautics Act of 1938

In 1934 the whole air transport industry was thrown into confusion when all mail contracts were canceled by the Democratic administration, because of alleged collusion between the mail carriers and Post Office officials of the previous administration and because of other abuses under the Watres Act.¹¹ The Army was ordered to fly the mail.

The cancellations of the air mail contracts focused public attention on the air mail situation, but before long the attention of the country was diverted from the mail issue because of the large number of

¹⁰ On February 19, 1934, there were 65 designs, the products of 18 different makers, in the fleets of air mail contractors. Twelve of the models had no passenger space; the remainder accommodated from two to 18 passengers each. Cruising speeds ranged from 100 to 190 miles per hour but were generally about 125 miles per hour.

¹¹ It was no sudden caprice on the part of the administration that caused the cancellations, but an accumulation of evidence. As early as 1932 there had been agitation for the cancellation of the contracts awarded in 1930. In February, 1933, the so-called Crane Committee of the House of Representatives reported that interlocking interests and directorates had definitely prevented the free development of aviation and had resulted in the waste of public funds. This report, commenting on the failure of the Watres Act to function properly, recommended that the rate-making powers of the Postmaster General be curbed. In the next session of Congress, the Crane Committee's report was re-enforced by the testimony before the Senate Special Committee on Investigation of Air Mail and Ocean Mail Contracts. For a detailed statement of these matters see Freudenthal, *op. cit.*, chap. viii. In July, 1941, a commissioner of the United States Court of Claims reported that there was no fraud in the air mail contracts canceled in 1934. This left the way open for the old companies, since reorganized under new names, to claim damages amounting to about \$2,500,000. For a detailed discussion see Paul M. Godehn and Frank E. Quindry, "Air Mail Contract Cancellations of 1934 and Resulting Litigation," *Journal of Air Law and Commerce*, Summer, 1954.

accidents occurring under Army operation of the air mail services.¹² The President was forced by these circumstances, including unusually bad weather conditions, to order the Army to curtail its flights.¹³ The Army thereafter flew the mail for several months on a restricted basis, and in the meantime the commercial airlines prepared themselves for the readjustments foreshadowed by Congressional hearings prior to the passage of the Air Mail Act of 1934.¹⁴

By the Air Mail Act of 1934, new mail contracts were to be issued under competitive bidding for an initial period of not over one year (later increased to three years); but it was stipulated that no contract was to be awarded to any person or company even remotely involved in the former "collusion" with post office officials.¹⁵ A threefold control of the industry was set up: (1) The Post Office Department awarded air mail contracts and enforced air mail regulations. (2) The Interstate Commerce Commission was to set "fair and reasonable" rates of mail pay and was directed to review rates periodically. Payments for air mail transport were to be kept within the limits of anticipated postage revenues, and no air mail carrier was to be permitted to make unwarranted profits out of its mail contract. An air mail postage rate of 6 cents per ounce or fraction thereof was set at this time. (3) The Bureau of Air Commerce in the Department of

¹² Although ten Army fliers died within a period of about four months, only four of this number were killed while actually carrying the mail, and six were in training or on the way to their mail routes.

¹³ To some, this proved the superiority of the commercial airlines and was an acknowledgment of hasty action in canceling the contracts. But to others, it pointed to the fact that there was something decidedly inadequate in the training of the Army Air Corps, and experts agreed that the Army was not trained at that time to fly across the country or in bad weather.

¹⁴ While the Army was carrying the mail from February to June, 1934, the airlines used the interlude to reorganize in order to be eligible to bid on the new temporary certificates which it was understood would be issued. Obviously, the nuclei of the old companies would continue and, if their compliance was legally sufficient, would get the awards. This was to be expected, as the only substantial amount of money available for airline operation was in the hands of the former mail carriers. See T. P. David, *The Economics of Air Mail Transportation* (Washington, D.C.: Brookings Institution, 1934), p. 207.

¹⁵ This stipulation was the cause of some rather ridiculous "reorganizations" among the airlines. Names were changed from "ways" to "lines": United Aircraft and Transport Corporation's transport division, United Air Lines, became United Air Lines Transport Corporation; American Airways of Aviation Corporation became American Airlines; Eastern Air Transport and Transcontinental and Western Air of the North American-General Motors Group had a good many changes involving "Inc.," "transport," and "lines" and finally became Eastern Air Lines, Western Air Express, and Transcontinental and Western Air, Inc. Besides making these name changes, the three large groups required certain black-listed officers to resign and complied with the law in diverse ways; but all of them showed a certain amount of continuity in their control and/or management. For a complete discussion of these complicated reorganizations see Freudenthal, *op. cit.*, chap. viii.

Commerce regulated the safety side of air transportation and was responsible for airway maintenance and development.

The period from 1934 to 1938 saw many changes in the organization of the air transport industry. Provisions of the Air Mail Act of 1934 intended to modify the existing relationships between the airlines and other groups interested in aviation, as well as other provisions, led to the creation of new corporate identities and caused numerous changes in the official personnel of the carriers. There were also a limited number of acquisitions or unifications of lines or routes during this period. At the end of 1933 there were 25 scheduled air carriers; at the end of 1934 there were 24; and at the end of 1938 the number had declined to 16. Competitive conditions, as evidenced by the provision in a few instances of nonmail service in a territory served by an airline holding a mail contract and by practices in connection with passenger fares, caused considerable difficulty and eventually played a part in bringing about a more comprehensive form of regulation. For another thing, the competitive bidding for air mail contracts was becoming ridiculous, since some companies bid as low as 0.0008 mills per mile on competitive routes with, of course, the expectation of later asking for, and in all probability receiving, an increase after the route had been established.

One very important difference in the whole aviation situation became apparent shortly after the period of upheaval caused by the cancellation of mail contracts came to a close. This was the separation of the aviation industry into two definite parts. From then on, transport and manufacturing were recognized as two separate industries, which they in fact are.

The volume of business done by the airlines increased in large measure during the period 1934-38, and this increase in business was accompanied by additional improvements in service. Representative speeds of about 110 miles per hour in 1934 rose to about 158 miles per hour in 1938; speeds attainable under conditions of most efficient utilization of equipment similarly rose from about 140 to 190 miles per hour. Larger and more comfortable airplanes were manufactured for airline use,¹⁶ the effective lives of airplanes were lengthened; and costs per seat-mile noticeably declined. Increases in the size of aircraft, however, made it more difficult to utilize certain of the existing airport facilities and necessitated airport improve-

¹⁶ The increase was from an average of eight or nine seats on July 1, 1934, to 12.7 seats four years later, with a range in the latter year from six to 21 seats per airplane.

ments. At the same time, larger airplanes gave the airlines an incentive to stress the long-haul passenger business.

From 1934 to 1938, additional capital became available to the airlines. Many of the factors attracting investors to this industry, previously discussed, were still operative; but in the later years there was the pressure of steadily increasing traffic which required investment in additional facilities. This probably was the major force demanding new capital, particularly after 1934, although it is hard to differentiate between it and the pressure of technical progress which forced the purchase of new aircraft but which, at the same time, was itself partially a response to the increasing traffic. A considerable proportion of the capital required by some airlines came out of earnings.¹⁷

It may be said that two good results came out of the air mail cancellations and resulting legislation: (1) The airlines were weaned from their complete dependence on air mail contracts and were induced to cultivate passenger and express business more intensively. (2) The separation of manufacturing and transport companies into two industries weakened, even if it did not entirely destroy, the control of the large, monopolistic holding companies.

The difficulties of the airlines, caused in part by the threefold control and other provisions of the 1934 act, were accentuated by a series of accidents in the winter of 1936-37, which undermined public confidence, and by the general business depression of early 1938. By the middle of 1938 the entire industry was in a chaotic state, with several major carriers facing bankruptcy, half the original investment in the airlines lost forever, and new capital so backward as to be practically unobtainable.

In consequence, the air transport industry itself was sponsor for the Civil Aeronautics Act of 1938, which provided for complete federal control over every phase of interstate airline operation. (See Chapter 4.)

¹⁷ See Healy, *op. cit.*, p. 126. Healy points out that, in spite of the apparently general feeling of many of the original contributors to the air transport industry that profit was not the controlling reason for their investment, a few of the lines actually made rather spectacular profits. In fact, these profits were high enough to be an important source of capital for expansion of their operations or improvement of their facilities. Western Air Express, Inc., plowed back \$3,000,000 of its earnings in this way, and Boeing Air Transport was able very quickly to retire the securities issued for the original \$700,000 cash put up and to earn in the neighborhood of \$1,000,000 a year, after deducting expenses, for the five years of its existence as an individual operator. See also *Hearings before Senate Special Committee on Air Mail and Ocean Mail Contracts* (73rd Cong., 2d sess., 1935), pp. 2253, 2274-75, 2855.

The Air Transport Industry from June, 1938, to December, 1941

The period between the adoption of the Civil Aeronautics Act of 1938 and the entry of the United States into World War II is one which may be characterized by the term "regulated expansion." It was also a fairly tranquil period, since for the first time commercial and other civil aviation in the United States had the benefit of a unified and comprehensive national policy, administered by a single federal agency.

The industry got off to a good start, as under the "grandfather" clause of the Civil Aeronautics Act the 16 airlines which had been in operation were granted certificates of convenience and necessity giving them permanent rights to their particular operations as of the effective date of the act, subject only to indefinite suspension or revocation for violation of the act. Within a short time nearly all the airlines applied for new routes. This was done partly because of the monopoly value which might be attached to any route certificate acquired as well as because it appeared that air transportation had possibilities of being a profitable operation and because of the desire to consolidate and protect dominant positions in various parts of the country. Some of these routes were also apparently sought for trading purposes to aid in obtaining other routes, as well as for protection against encroachment.¹⁸ Some new routes were also sought by entirely new companies which had never operated before, but most of them could be classified as feeder or local service routes to be operated by existing airlines. In addition, there were applications pending for a number of new stops on existing routes.

The Air Transport Industry in World War II

With the entry of the United States into World War II in December, 1941, the airlines, which had felt the pressure of oncoming hostilities in many ways for months previously, definitely became a war industry. Early in the spring of 1942, 221 of the 370 transport airplanes then operated by the airlines were ordered turned over, by sale or lease, to the armed services of the United States and to others of the allied nations. Many new airplanes which the airlines had on order with aircraft manufacturers had previously been relinquished at the request of the federal government. In addition, the government

¹⁸ If all applications for proposed airline routes as of June 30, 1940, had been granted by the Civil Aeronautics Board, the air transportation system of the United States would have been increased by at least 50 per cent.

stipulated that the airlines would be expected to loan equipment and personnel for special military missions and to transport priority passengers and cargo on their scheduled flights. Left with less than 50 per cent of their original fleet to continue their operations under private management and as separate, independent entities, the airlines rescheduled their operations by eliminating some stops, curtailing 28 per cent of the prewar schedules, and suspending certain routes for the duration. All discounts for round trips and the 15 per cent reduction in passenger fares to credit card holders were discontinued.

The phenomenal operating achievements of the airlines during the war, accomplished through complete utilization of equipment and operating efficiency, are apparent when the traffic volume carried is compared with the number of aircraft available. There were large and impressive increases in mail, express, and passenger loads per airplane. The average passenger load factor for each plane on every flight rose from 64 per cent in 1941 to an almost full capacity load—91 per cent—in 1944. While the load factor was rising, the total number of passengers carried began diminishing in 1942 with the loss of equipment and reached the low ebb, since 1940, in 1943 with a total of 3,454,040 revenue and nonrevenue passengers for the year. These figures do not reveal the fact that some of the scheduled flights of certain airlines were approximately 100 per cent priority passengers and flew a 97 to 99 per cent capacity load every trip. Nor do they show the number of passengers turned away or removed each day for priority passengers, mail, or express.

Although the domestic airlines' operations were war-curbed by lack of equipment and suspension of a number of routes, the airlines continued to maintain their mileage near the prewar level. During 1944 the airlines' network in operation stood at 47,384 miles, compared with the 42,757 operating mileage before Pearl Harbor.

The wartime boom in airline traffic caused investors and speculators to look upon the airlines with favor. While the military contracts¹⁹ made by the air carriers were on a cost-plus-fixed-fee basis, the airlines profited by these activities and also by their commercial

¹⁹ It should be realized that, at the same time the airlines were meeting the demands for wartime traffic to the best of their ability in their commercial services, almost all of them were engaged in the performance of military contracts. They ferried military aircraft; they modified, repaired, and overhauled military aircraft engines and other equipment; they trained pilots; they maintained extensive passenger and cargo transport services over most of the world; they engaged in the emergency movement of troops; they transported wounded; they built airports; and they established airways.

TABLE 12

DOMESTIC SCHEDULED OPERATORS, AIRCRAFT IN SERVICE, AVERAGE AVAILABLE SEATS, AND ROUTE MILEAGE OPERATED, 1926-54

AS OF DECEMBER 31*	OPERATORS	AIRCRAFT IN SERVICE	AVERAGE AVAILABLE SEATS†	ROUTE MILEAGE OPERATED
1926	13	‡	‡	‡
1927	18	‡	‡	‡
1928	34	268	‡	‡
1929	38	442	‡	‡
1930	43	497	‡	30,293
1931	39	490	‡	30,857
1932	32	456	6.61	28,956
1933	25	418	7.59	28,283
1934	24	423	8.86	28,609
1935	26	363	10.33	29,190
1936	24	280	10.67	29,797
1937	22	291	12.52	32,006
1938	16§	260§	13.91	34,879§
1939	18||	276||	14.66	36,654||
1940	19	369	16.54	42,757
1941	19	370	17.54	45,163
1942	19	186	17.91	41,596
1943	19	204	18.34	42,537
1944	19	288	19.05	47,384
1945	20	421	19.68	48,516¶
1946	24	674	25.25	53,981¶
1947	28	810	29.93	62,224¶
1948	31	878	32.37	68,674¶
1949	37	913	35.03	73,955¶
1950	38	960	37.47	77,440¶
1951	38	981	39.55	78,913¶
1952	35	1,078	42.71	77,977¶
1953	32	1,139	46.07	78,384¶
1954	32	1,175	50.06	78,294¶

* For the years 1938-48 route mileage operated is a weighted average for the month of December; for 1949 and subsequent years the route mileage operated is based on the 4th quarter.

† Obtained by dividing passenger-seat-miles by revenue-miles flown in passenger service.

‡ Not available.

§ Does not include Colonial and Marine Airlines.

¶ Does not include Marine Airlines.

|| Data subsequent to 1944 based on revised CAB procedures.

Source: CAA, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954). 1954 figures from CAA.

transport operations. In fact, the extraordinary passenger traffic boost and the still greater expansion of air mail and air express traffic caused nearly all of the airlines, which had frequently been operating at a loss before the war, to show healthy net operating incomes.

The first impact of the end of the war was felt early in 1945, before the German surrender May 8 of that year. The airlines began to receive back many of the airplanes turned over to the armed services in 1942; and as soon as possible after VE Day, the Army started turning over other aircraft it no longer needed. Also, realizing the serious-

TABLE 13
UNITED STATES SCHEDULED INTERNATIONAL OPERATORS, AIRCRAFT,
ROUTE MILEAGE, AND LENGTH OF TRIP, 1927-54

CALENDAR YEAR*	OPERATORS	AIRCRAFT IN SERVICE	ROUTE MILEAGE	AVERAGE LENGTH OF PASSENGER TRIP (MILES)
1927	1	†	†	†
1928	1	57	†	†
1929	4	83	†	†
1930	3	103	19,256	464
1931	3	100	19,543	238
1932	3	108	19,574	289
1933	3	86	19,404	315
1934	2	99	22,192	351
1935	2	101	31,261	381
1936	2	94	31,990	414
1937	2	92	31,979	416
1938	2	73	34,968	487
1939	2	84	43,455	557
1940	3	68	52,322	614
1941	3	83	†	713
1942	3	68	†	880
1943	3	70	27,211	874
1944	3	70	29,708	910
1945	4	97	38,885	942
1946	9	147	66,419	1,057
1947	12	154	95,503	1,332
1948	13	175	105,853	1,376
1949	13	177	109,011	1,351
1950	12	160	106,401	1,316
1951	12	140	108,763	1,273
1952	13	149	110,465	1,277
1953	14	161	111,826	1,254
1954	15	161	112,488	†

* Operators and Aircraft in Service are as of December 31 of each year. Route mileages for 1930 through 1940 are Dec. 31 figures, for 1943 through 1948 they are averages for the month of December, for 1949 and subsequent years the route mileage operated is based on the fourth quarter.

† Not available.

Source: CAA *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954). 1954 figures from CAA.

ness of the airline flight equipment shortage, the War Production Board in the latter part of April, 1945, issued a priority regulation clearing the way for immediate production of new aircraft for the commercial airlines or for civilian transport production. Previously, the War Production Board had been laboring under the impression that the airlines could secure sufficient equipment to satisfy their needs from airplanes released by the Army and the Surplus Property Board. The airlines asked for 321 planes, more than two thirds of which were four-engine equipment, delivery requested for the last quarter of 1945.

Even though some equipment was allocated to the airlines by the Surplus Property Board before the end of the war in Europe, these aircraft had to be reconverted to the needs of the airlines and to commercial standards as required by the Civil Aeronautics Board. In many instances, more man-hours were required to put an airplane back in operation than it took to build a new airplane of the same type; and costs of reconverting an airplane ran as high as \$90,000 in some cases, which was almost as much as a new airplane of the same type would have cost.²⁰

The worst part of the situation was, however, that the scarce mechanical and other help which was used to reconvert aircraft returned by the Army could otherwise have been used by the airlines in keeping their present airplanes in operation. Thus, the airlines' ability to operate efficiently was made more complicated by having to use their experienced personnel in reconverting surplus equipment.

A tremendous load was put on the facilities of the commercial airlines with the end of the war in Europe, because they were faced with the task of transporting military and war-important civilians to the west coast of this country at a time when their flying equipment was still very limited. However, the consensus at that time among airline people was that, although the situation would be tight, the task of transporting military and war-important civilians to the west coast would not be an impossible one. They were correct in these assumptions; but they were not anticipating, and therefore completely overlooked, a very important factor in their calculations. The military and the railroads had miscalculated the railway facilities that would be required to transport the troops who were being deployed from Europe to the Pacific theater of war. When the movement finally got underway, it was found that the railroads could not possibly handle all the traffic; and it was decided that the airlines would have to relieve the railroads of part of the load. This only added to the already overcrowded and confused situation on the airlines.

The demand for airline space became so acute that the airlines adopted the policy of confirming no advance reservations west of Chicago, where the conditions were worst. The carriers at that time were operating with a load factor of 90 to 95 per cent capacity west from Chicago, with priority demands taking 90 per cent of the space. The priority load became so heavy that only the highest priority passengers could expect to reach their destination on transcontinental flights either east- or west-bound. This situation was eased somewhat

²⁰ Before the war a DC-3 cost about \$125,000 new.

by the gradual release by the Army and Surplus Property procedures of 210 aircraft, which were reconverted and placed in service. These airplanes brought the airline fleet up to a total of 375 planes, more than they ever had in operation before. The Army also co-operated by releasing transport captains so that the airlines would have sufficient personnel to operate the additional equipment. Other personnel, such as co-pilots and mechanics, were also discharged but more slowly. Five airlines were assigned Army aircraft to operate transcontinental troop movements requiring 20 flights daily under contract. The original plan was to carry 25,000 men a month across the nation in the redeployment program.

After the end of the war with Japan, the airlines suddenly found themselves in the midst of plenty of available equipment as compared to the serious shortage which existed when the European war was over. Although much surplus equipment became available, the airlines in many cases did not wish to buy it from the government. Instead, they preferred to rent existing Army types until more suitable airplanes became available.

In October, 1945, the priority system was abolished, which presented the airlines with a new set of problems, since airline reservations and ticketing personnel were accustomed to the priority system, with many having worked under no other. Moreover, the abandonment of the priority system came at a time when the railroads were still very much congested. The result was a very large shifting of passenger travel to the airlines, so that the total volume of passengers to be handled was still large.

The Air Transport Industry since World War II

With the close of World War II the expansive characteristics of early periods again became apparent with the acquisition and conversion of surplus military aircraft, the placing of orders for millions of dollars worth of more modern and faster postwar aircraft, the recruiting and training of large numbers of new personnel, and the later acquisition, testing, and introduction into service of the new, faster, and larger types of aircraft. The conversion of management and of techniques of control from the needs of the small-scale operations of the past to those of the large-scale operations which in the postwar period suddenly confronted airline managements is only one of the many and varied aspects of the expansion program. The management problems were complicated not only by the magnitude of the expansion but also by its rapidity, and they extended into all the financial and operational activities of the carriers. (See Tables 14-17.)

TABLE 14
SELECTED STATISTICS OF DOMESTIC TRUNK-LINE SCHEDULED AIR CARRIERS
(Calendar Years 1946-54)

Item	1946	1947	1948	1949	1950	1951	1952	1953	1954
Aircraft in service.....	631	748	790	778	796	821	914	938	*
Route mileage operated.....	48,168	51,100	54,679	55,689	56,117	55,912	55,545	54,556	*
Total plane-miles flown (millions)	322.3	326.0	326.4	331.8	337.5	374.5	425.2	480.7	*
Available ton-miles flown (millions)	982.2	1,212.3	1,357.9	1,517.4	1,684.1	1,974.0	2,399.5	2,893.4	*
Revenue passengers carried (millions)	11.9	12.3	12.4	14.0	16.0	20.6	22.8	26.0	28.8
Revenue passenger-miles flown (millions)	5,903	6,028	5,852	6,571	7,766	10,211	12,121	14,237	15,950
Ton-miles of cargo including excess baggage (millions) ..	44.2	74.6	107.2	128.6	157.6	150.5	169.0	174.2†	180.7†
Ton-miles of U.S. Mail (millions)	32.9	32.9	37.5	40.9	46.3	62.9	68.3	72.2	81.3
Total revenue ton-miles (millions)	650.1	689.1	706.2	809.0	963.3	1,204.7	1,413.5	1,643.3	1,813.0
Passenger revenue (\$ million)	272.6	303.2	344.7	378.1	430.1	570.3	671.3	771.4	860.8
Cargo revenue (\$ million)	16.1	22.3	27.6	31.6	39.2	41.6	48.5	46.1	46.2
U.S. Mail revenue (\$ million adjusted)	21.3	31.2	42.6	45.9	48.1	39.0	36.0	36.3	39.5
Other operating revenue (\$ million)	2.9	3.6	3.2	5.0	8.5	9.6	12.3	21.3	18.8
Total operating revenue (\$ million)	312.9	360.3	408.1	460.6	525.9	660.5	768.1	875.1	965.3
Total operating expenses (\$ million)	317.1	373.4	411.3	435.2	461.5	552.6	672.9	793.2	885.0
Total operating profit or () loss (\$ million)	(4.2)	(13.1)	(3.2)	25.4	64.4	107.9	95.2	91.9	80.3

* Not available.

† Excluding excess baggage.

Source: CAA, *A Program of Charges for the Use of the Federal Airways System, 1953*. Air Transport Association for 1953 and 1954 figures.

TABLE 15

SELECTED STATISTICS OF DOMESTIC SCHEDULED LOCAL-SERVICE AIR
CARRIERS INCLUDING HELICOPTERS
(Calendar Years 1946-54)

Item	1946	1947	1948	1949	1950	1951	1952	1953	1954
Aircraft in service.....	32	49	73	120	148	139	145	164	*
Route mileage operated.....	2,409	6,646	11,346	13,775	19,316	21,298	21,317	22,205	*
Total plane-miles flown (000).....	3,314.3	10,714.1	19,036.3	25,803.4	35,035.0	40,459.8	43,300.0	46,553.0	*
Available ton-miles flown (000).....	1,762.4	14,976.0	31,576.1	46,519.6	62,552.1	81,680.0	96,020.6	*	*
Revenue passengers carried (000).....	25.1	237.0	425.7	677.8	969.4	1,480.5	1,736.4	2,022.4	2,450.0
Revenue passenger-miles flown (000).....	6,812	46,990	88,937	134,698	188,782	289,644	339,763	398,613	453,000
Ton-miles of cargo (000).....	27.8	204.9	495.1	815.6	1,436.3	1,959.6	2,172.2	2,133.6	2,275.0
Ton-miles of U.S. Mail (000).....	60.1	167.6	362.0	473.9	629.0	857.4	986.8	965.5	1,220.0
Total revenue ton-miles (000).....	687.9	4,740.7	9,130.1	14,391.2	20,960.1	31,682.4	36,191.9	40,699.0	48,000.0
Passenger revenue (\$ 000).....	314.6	2,280.1	4,666.5	7,362.0	10,302.9	16,259.2	19,766.7	23,329.0	26,900.0
Cargo revenue (\$ 000).....	14.7	70.2	172.0	292.9	502.1	759.3	942.5	925.0	975.0
U.S. Mail revenue (\$ 000 adjusted).....	1,691.2	7,187.6	12,020.0	14,595.6	18,112.8	19,731.0	21,708.6	23,832.2	26,000.0
Other operating revenue (\$ 000).....	43.1	140.9	171.4	230.7	484.5	875.5	502.3	771.0	125.0
Total operating revenue (\$ 000).....	2,063.6	9,678.8	17,029.9	22,481.2	29,402.3	37,624.0	42,920.1	48,358.7	54,000.0
Total operating expenses (\$ 000).....	2,060.4	9,069.3	15,923.5	22,381.7	27,820.7	36,715.6	44,542.1	50,420.4	53,000.0
Total operating profit or () loss (\$ 000).....	3.2	609.5	1,106.4	99.5	1,581.6	908.4	(1,622.0)	(2,061.7)	1,000.0

* Not available.

Source: CAA, *A Program of Charges for the Use of the Federal Airways System, 1953*, Air Transport Association for 1953 and 1954 figures.

TABLE 16
SELECTED STATISTICS OF DOMESTIC SCHEDULED ALL-CARGO CARRIERS
(Calendar Years 1950-53)

Item	1950	1951	1952	1953
Aircraft in service	48	62	61	60
Total plane-miles flown	15,759.3 ^a	18,733.8 ^b	16,866.4 [†]	19,416.5
Available ton-miles flown (000) . .	92,821.6 ^a	117,753.2 ^a	108,983.4 [†]	119,889.0
Ton-miles of cargo (000)	71,415.5 ^a	97,364.8 ^a	90,107.4 [†]	96,925.8
Total revenue ton-miles (000) . . .	71,415.5 ^a	97,364.8 ^a	90,107.4 [†]	99,743.4
Cargo revenue (\$ 000)	10,676.9	14,605.5	13,137.9	14,160.8
Other operating revenue (\$ 000) . .	1,683.3	2,418.5	2,378.3	4,349.3
Total operating revenue (\$ 000) . .	12,360.2	17,023.9	15,516.1	18,510.1
Total operating expenses (\$ 000) . .	10,790.3	14,364.8	14,396.3	18,343.6
Total operating profit or () loss (\$ 000)	1,569.9	2,659.1	1,119.8	1,675.4

^a Includes military contract operations of Slick Airways

[†] Includes military contract operations of Slick Airways for last six months of 1951.

Source: CAA, *A Program of Charges for the Use of the Federal Airways System, 1953*. Air Transport Association for 1953 figures.

One of the problems, that of re-equipment, was not limited to aircraft alone. The introduction of new types of airplanes brought with it a long series of demands for other new equipment. Overhaul shops and maintenance bases had to be equipped to handle the new airplanes and engines; new servicing facilities and loading devices were required; and spare-parts inventories had to be replaced. As a result, the replacement of the airline fleet became a major operation. Yet in 1946 the airlines not only had to undergo such an operation but at the same time were faced with the fact that they would have to go through another such operation within the next three or four years when the real postwar aircraft were expected to be available.

Another problem that had to be handled was expanding to meet the public demands; that is, making up in a short period of time for all the growth which had been lost during the four war years. All the forces which stimulate growth in a transportation industry had been at work during the war years, but they had been forcibly confined by government action. With the end of the war and the relaxation of travel restrictions, airline capacity was utterly incapable of handling the demand. Greater airline capacity seemed only to accelerate this growth. For example, in 1944 domestic revenue passenger-miles increased 39 per cent over 1933; and in 1945 there was another increase of 49 per cent over 1944. In spite of the fact that the airline fleet, even at the end of 1945, was inadequate to supply the service demanded, passenger traffic had already grown to nearly two and a

TABLE 17
SELECTED STATISTICS OF UNITED STATES INTERNATIONAL SCHEDULED
AIR CARRIERS
(Calendar Years 1946-54)

Item	1946	1947	1948	1949	1950	1951	1952	1953	1954
Aircraft in service*	147	373	468	481	484	469	479	543	†
Total revenue plane-miles flown (millions) . . .	59.3	86.5	98.0	104.5	93.8	97.5	103.4	109.0	†
Available ton-miles flown (millions) . . .	211.7	418.3	468.8	535.0	544.9	599.3	682.7	687.0	†
Revenue passengers carried (millions) . . .	1.0	1.4	1.4	1.5	1.6	2.0	2.3	2.6	2.8
Revenue passenger miles flown (millions) . .	1100	1810	1889	2054	2206	2560	3020	3368	3700
Ton-miles of cargo including excess baggage and foreign mail (millions)	20.6	41.3	53.9	66.0	70.4	82.4	85.7	88.7	98.4
Ton-miles of U.S. Mail (millions)	6.1	12.7	17.1	19.4	21.2	21.2	22.0	24.4	33.6
Total revenue ton-miles (millions) ‡	136.8	238.4	265.4	297.1	319.7	371.4	418.5	457.2	519.6
Passenger revenue (\$ million)	91.5	140.6	151.4	158.5	160.7	184.7	212.5	234.5	253.1
Cargo revenue (\$ million)	11.4	17.5	20.9	22.2	21.7	25.3	26.8	27.2	29.5
U.S. Mail revenue (\$ million)	25.1	32.3	57.4	75.1	55.6	53.2	51.5	52.9	56.1
Other operating revenue (\$ million)	18.8	18.5	19.7	18.4	22.2	24.8	24.1	23.1	19.1
Total operating revenue (\$ million)	146.7	209.1	249.2	274.2	260.2	288.0	315.0	337.6	358.7
Total operating expenses (\$ million)	139.9	209.3	253.3	252.8	248.3	269.8	301.2	313.7	329.0
Total operating profit or () loss (\$ million) . . .	6.8	(.2)	3.9	21.4	11.9	18.2	10.8	23.9	29.7

* As of December 31 of each year. Certain domestic trunklines have aircraft certificated for both domestic and international operations. The annual number of aircraft certificated for both operations are: 1946, 16; 1947, 219; 1948, 293; 1949, 304; 1950, 324; 1951, 329; 1952, 330; 1953, 385.
† Not available.
‡ Includes nonscheduled revenue ton-miles.

Source: Compiled from Air Transport Association, *Air Transport Facts and Figures, 1954*. Estimated figures for 1954 by Air Transport Association.

half times its 1941 size. Even the great additions to the airline fleet made in 1946 did not seem to make much impression on filling passenger demand. During this year the airlines operated nearly $7\frac{1}{2}$ billion seat-miles, as compared with $3\frac{3}{4}$ billion the previous year and only $2\frac{1}{3}$ billion in 1941. Nevertheless, revenue passenger-miles increased 75 per cent over 1945 and grew to four and a quarter times the 1941 figure, with the passenger load factor dropping back only to 78.8 per cent, a figure generally regarded as being in excess of the highest load factor compatible with adequate service.

In 1946 the long-range growth in passenger demand stopped abruptly and unexpectedly. In that year domestic passenger traffic leveled off; and in 1948 it turned down, but in 1950 started upward again due in part to the increased military activity after July of that year and has since continued to grow. (See Tables 14 and 15.)

Another aspect of postwar air carrier development was the increase in competition, which came about in several ways: (1) by new routes and route extensions which were authorized by the Civil Aeronautics Board through the issuance of new permanent or temporary certificates of convenience and necessity or through the amendment of already existing certificates, (2) by the operations of contract carriers not subject to any economic regulation under the Civil Aeronautics Act, and (3) by the authorization of additional common carrier operations under blanket exemptions issued by the Civil Aeronautics Board.²¹

With the outbreak of war in Korea, air transportation was again affected by a greatly swollen traffic demand, coupled with economic uncertainties more serious than any which had confronted it for several years. A financial crisis developed in 1947 and 1948, leading to the development of a program of adjustment which gave promise of an economically sound industry with standards of public service higher than ever before. It seemed, early in 1950, that this industry was in all probability launched upon a period of steady and healthy growth. But following the outbreak of the Korean war, a radically new situation developed. The industry was seized with an aircraft shortage which recalled its experience during World War II. Passenger, freight, and mail traffic increased greatly and reservation systems were strained to the breaking point. Gross revenues and profits increased; but at the same time taxes increased, wages and other

²¹ See Chapters 6 and 7. For a detailed study of the competitive situation see Frederick W. Gill and Gilbert L. Bates, *Airline Competition* (Cambridge, Mass.: Harvard University, 1949).

operating costs jumped, and the cost of new equipment soared, reflecting not only increased manufacturing costs, but scarcity value as well.

There was a great acceleration in the airlines' programs for obtaining new equipment between 1951 and 1953. The seat capacity of the domestic lines by the end of 1953 was 49 per cent greater than at the start of 1952, even on the standard seating basis. During this period more equipment was converted to coach-class traffic with high-density seating, which increased seat capacity even further. In addition, the new aircraft had much greater speed than the old, and each seat therefore produced more seat-miles. With an increase in seats of only 49 per cent, the available seat-miles thus increased 59 per cent. A slight daily increase in the utilization of these aircraft increased the industry's carrying capacity still more. This enormous growth in capacity meant that the use of air transportation must greatly increase if the disastrous economic consequences of over-capacity were to be avoided.

Since the close of World War II, the inflation in airline costs has gradually caught up with airline efficiency. The airline industry, until 1951 at least, was in a peculiarly fortunate position. In spite of postwar price inflation, the airlines acquired aircraft of improved economic performance, which together with managerial methods and controls, made it possible for airline unit costs to be steadily reduced. At the same time that wages and price levels were pushing upward, the airlines were realizing the maximum economies inherent in the larger equipment. Warning signs appeared during the latter part of 1951, however, indicating that the rising costs were beginning to outstrip airline economies. Since then, while traffic has continued to grow, it has not kept pace with the increase in airline costs.

The airline cost situation, however, should not be permitted to cloud the continuous growth record of the certificated airlines. In 1954, these carriers again registered increases in nearly all aspects of their business. (See Tables 14-15 and 17.) They are still enjoying a dynamic growth in traffic and there are no strong indications that this development will stop. The airlines will continue to increase their share of the common carrier market for passenger travel; great possibilities in the air freight field are seen and aggressive efforts to develop them are underway; there is a growing possibility that all first-class mail will be transported by air whenever time can be saved; and constant technological advances in both flight and ground equipment are resulting in greater efficiency and regularity of schedules.

Types of Commercial Air Carriers

There are nine principal types of commercial air carriers comprising the air transport industry of the United States. These are based upon the scope of operations authorized or allowed by the Civil Aeronautics Board under the Civil Aeronautics Act of 1938. They are:

1. *Domestic Trunk Carriers.* Those permanently certificated scheduled air carriers engaged in the transportation of mail, passengers, and property over the major airline routes of the country. These are:

American Airlines	National Airlines
Braniff International Airways	Northeast Airlines
Capital Airlines	Northwest-Orient Airlines
Colonial Airlines	Trans World Airlines
Continental Air Lines	United Air Lines
Delta-C&S Air Lines	Western Air Lines
Eastern Air Lines	

2. *Domestic Local-Service Carriers.* Those temporarily certificated scheduled air carriers operating, in general, between smaller communities and the major traffic centers. These are:

Allegheny Airlines	Ozark Air Lines
Bonanza Air Lines	Piedmont Airlines
Central Airlines	Pioneer Air Lines
Frontier Airlines	Southern Airways
Lake Central Airlines	Southwest Airways Co.
Mohawk Airlines	Trans Texas Airways
North Central Airlines	West Coast Airlines

3. *International and Overseas United States Carriers.* This group includes all United States flag air carriers authorized to operate between the United States and foreign countries, between foreign countries, and the extension of certain domestic trunk lines into Canada, Mexico, and the Caribbean area. These are:

American Airlines	National Airlines
Braniff International Airways	Northwest Airlines
Caribbean-Atlantic Airlines	Pacific Northern Airlines
Colonial Airlines	Pan American-Grace Airways
Delta-C&S Air Lines	Pan American World Airways
Eastern Air Lines	Trans World Airlines
Mackey Air Transport	United Air Lines
Midet Aviation Corp.	Uraba, Medellin & Central Airways

4. *Territorial Carriers.* Certificated scheduled air carriers operating in Hawaii and Alaska. These are:

HAWAIIAN AIR CARRIERS

Hawaiian Airlines

Trans-Pacific Airlines

ALASKAN AIR CARRIERS

Alaska Airlines

Ellis Airlines

Alaska Coastal Airlines

Munz Airways

Bristol Bay Airlines

Northern Consolidated Airlines

Byers Airways

Pacific Northern Airlines

Christensen Air Service

Reeve Aleutian Airways

Cordova Airlines

Wien Alaska Airlines

5. *Certificated All-Cargo Lines.* Operators holding temporary certificates to maintain scheduled all-cargo flights, carrying neither mail nor passengers, between designated areas in the United States and, in some cases, foreign countries. These are:

Aerovias Sud Americana

Slick Airways

Riddle Airlines

U.S. Airlines

Flying Tiger Line

6. *Helicopter Services.* These hold temporary certificates to operate between airports, central post offices, and suburbs in the metropolitan areas of Chicago, Los Angeles, and New York. At Chicago only mail is carried, but at New York and Los Angeles mail, passengers, and property are carried. These operators are:

Helicopter Air Service

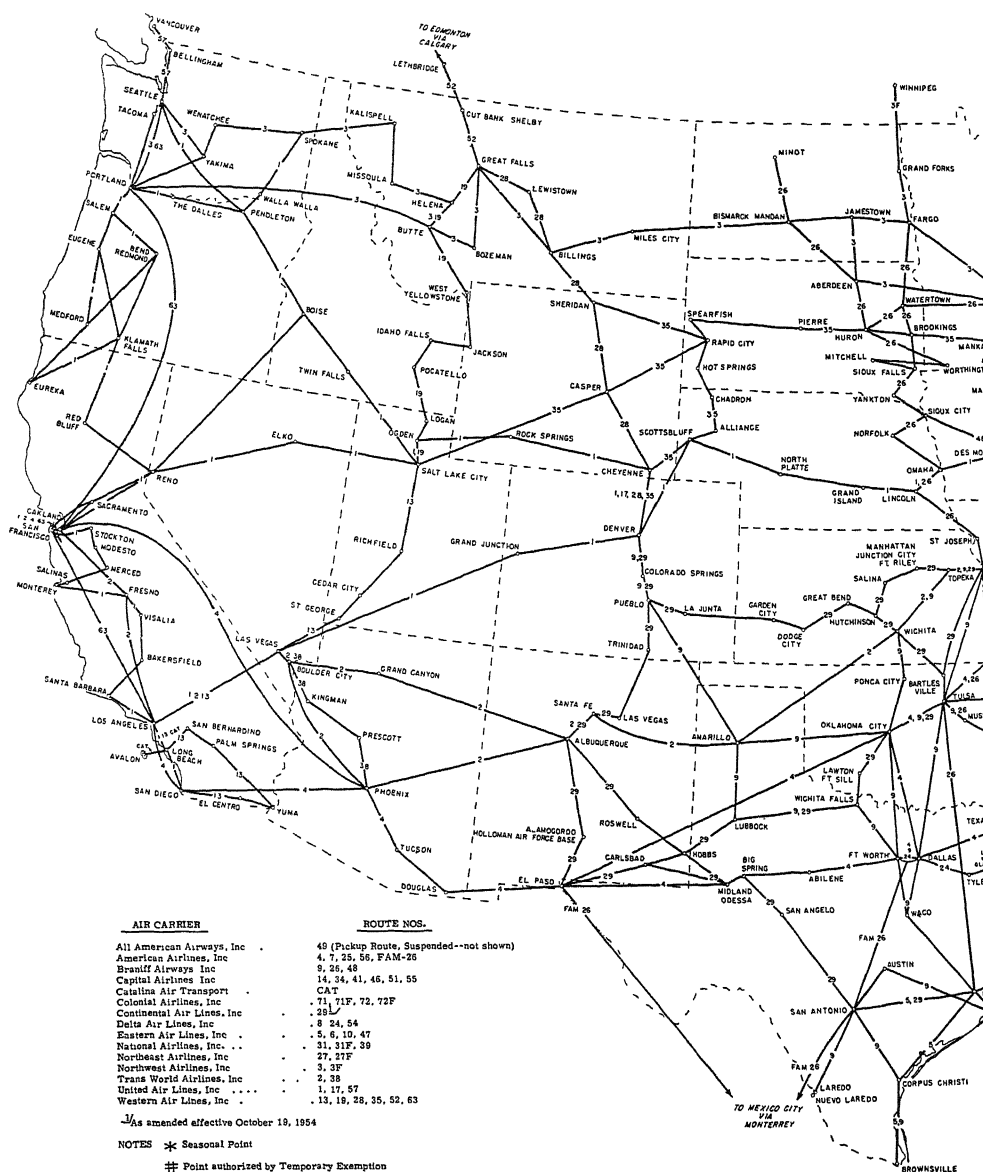
Los Angeles Airways

New York Airways

7. *Certificated Cruise Carriers.* These operators carry passengers only in connection with escorted all-expense tours between specified areas or points. Only one is now operating:

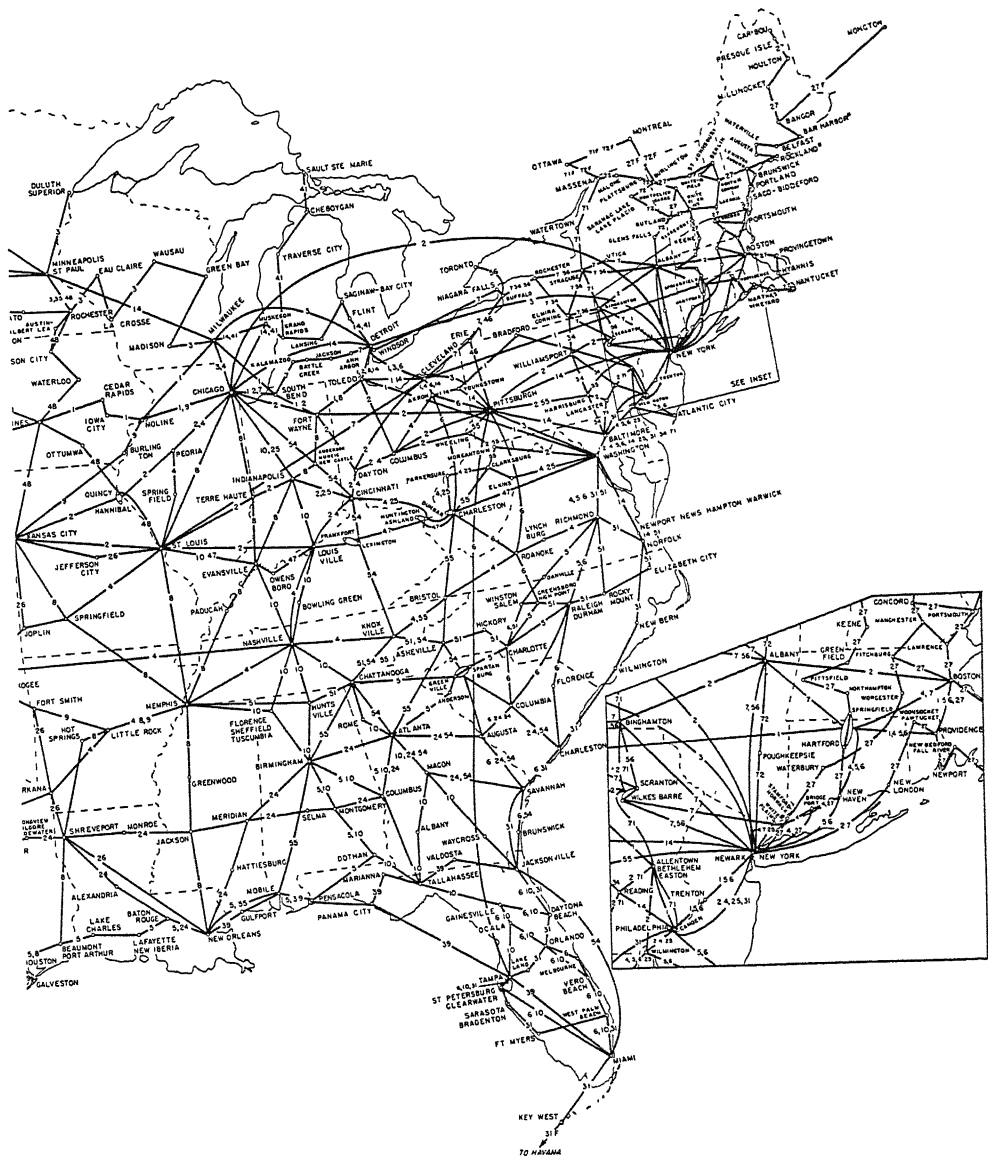
Resort Airlines

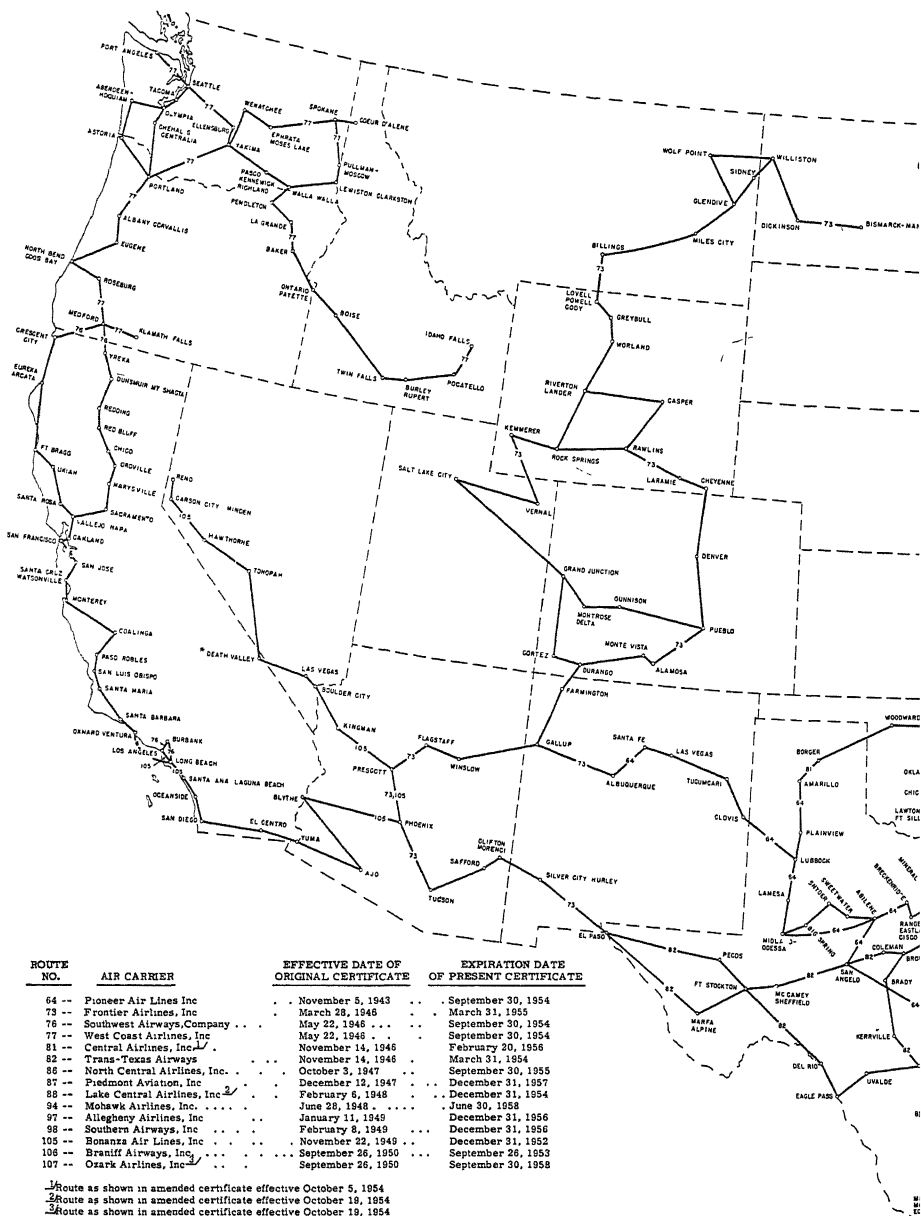
8. *Irregular Air Carriers.* A diversified group of operators of various types of air service authorized by the Civil Aeronautics Board through the exemption process, rather than through the requirement that a certificate of public convenience and necessity be obtained. This group changes from time to time as new companies or operators start or as others go out of business entirely, combine with others, or simply change their names. Therefore, a list of air carriers compris-



Source: Civil Aeronautics Board

FIG. 21. Permanently certified airlines of the United States.





HELICOPTER ROUTES NOT SHOWN ON MAP

84 --	Los Angeles Airways, Inc.		
	(Los Angeles Area)	May 20, 1947	September 30, 1956
96 --	Helicopter Air Service, Inc.		
	(Chicago Area)	January 23, 1949	July 23, 1954
111 --	New York Airways, Inc.		
	(New York City Area)	December 3, 1951	March 31, 1957

Source: Civil Aeronautics Board.

FIG. 22. Local-service airlines certificated for limited period, United States.

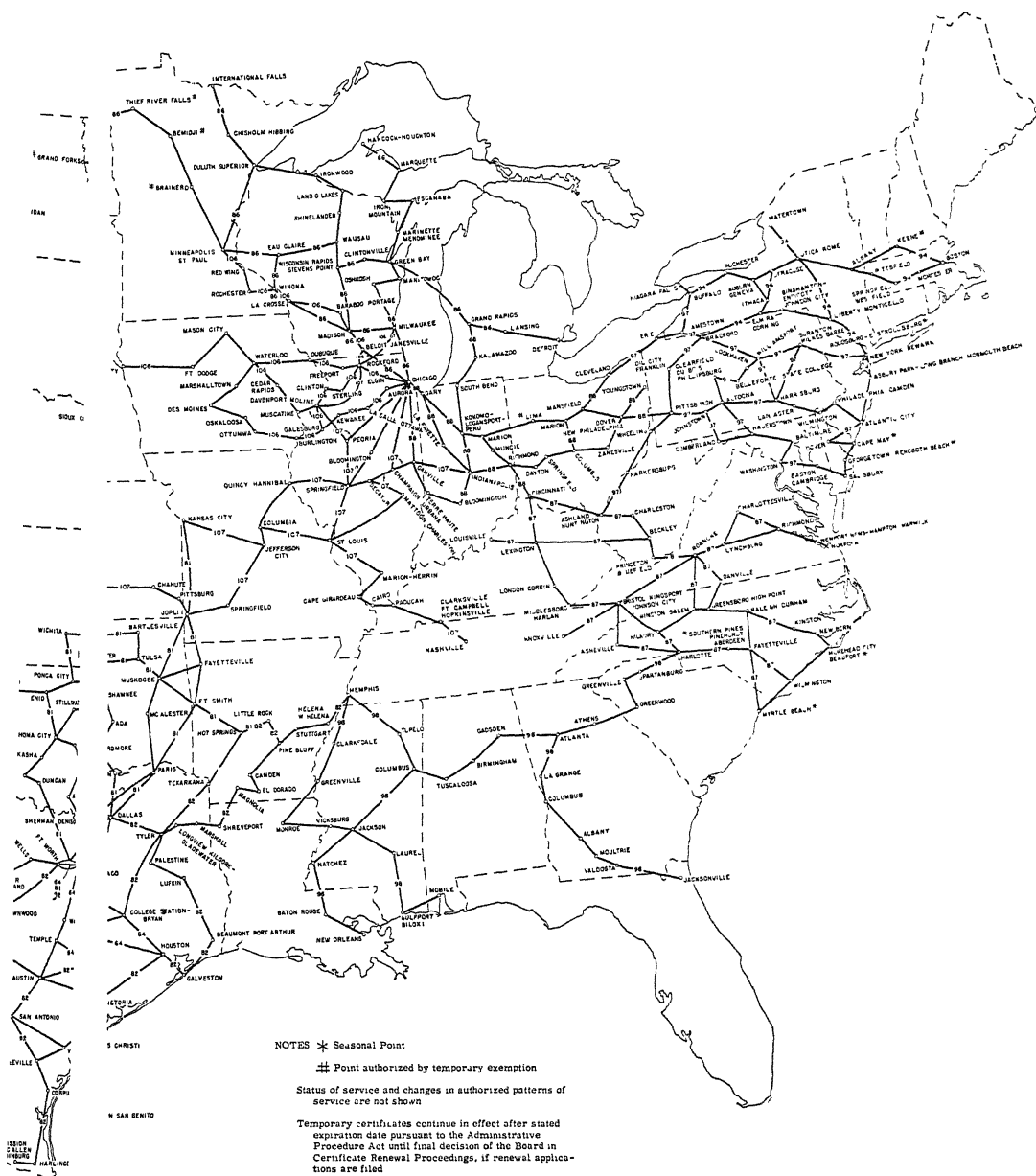


TABLE 18

SCHEDULED AIR TRANSPORT INDUSTRY OF THE UNITED STATES, 1953

Airline	Total Employees	Annual Payroll (\$)	Un-duplicated Route Miles	Scheduled Revenue Passenger Miles	Total Scheduled Passengers Flown	Total Cargo/ Mail Ton-Miles	Total Revenues (\$)
DOMESTIC TRUNK (Including foreign operations)							
American Airlines	16,726	..	10,831	3,289,972,000	5,817,000	83,143,000	208,305,856
Braniff Airways	4,004	18,000,000	15,578	553,384,000	1,313,798	2,661,371	40,000,000*
Capital Airlines	4,446	24,000,000	5,160	716,000,000	2,248,998	9,424,784	45,580,524
Colonial Airlines	773*	3,901,081	3,013	131,520,056	418,756	665,488	9,090,168*
Continental Air Lines	921	4,433,824	3,195	147,508,685	368,490	541,984	9,277,080*
Delta-C&S Air Lines	4,285	19,893,662	10,035	26,560,770	1,461,625	11,260,704	42,338,850
Eastern Air Lines	10,246	50,000,000*	11,829	2,500,000,000*	4,750,000*	19,000,000*	..
National Airlines	2,915	12,900,000	2,829	618,005,000	889,273	9,334,175	35,232,967
Northeast Airlines	864	4,027,011	2,273	91,398,933	463,712	1,036,609	8,497,440*
Northwest Airlines	5,420	28,600,000*	17,255	851,174,754	1,098,693	18,229,181	61,996,213*
Trans World Airlines	15,000	..	33,000	2,881,066,000	3,100,000	54,244,000	..
United Air Lines	14,921	77,525,000	10,809	2,717,407,639	3,950,740	59,582,764	172,967,280
Western Air Lines	1,813	8,743,753	5,429	359,115,000	837,384	3,890,409	22,879,000*
TERRITORIAL INTERNATIONAL							
Caribbean Atlantic Airlines	175	526,000*	388	9,744,378	120,491	31,027	1,199,280
Hawaiian Airlines	515	2,541,298	404	52,058,919	394,970	1,492,822	4,901,889
Pan American-Grace Airways	1,338	..	8,784	136,038,000	124,819	3,583,722	..
Pan American World Airways	17,254	84,200,000	62,050	2,015,103,000	1,657,275	74,441,448	..
Trans-Pacific Airlines	207	868,414	1,007	19,789,167	158,107	107,729	1,824,460
LOCAL SERVICE							
Allegheny Airlines	486	2,102,705	2,221	31,234,848	212,049	3,214,999	4,079,750
Bonanza Air Lines	201	933,000	1,449	15,245,000	65,651	85,362	1,820,000*
Central Airlines	304	1,000,000	1,428	6,397,000	42,496	683,772	2,075,000*
Frontier Airlines	550	2,570,000	3,086	32,389,000	127,765	605,088	4,900,000
Lake Central Airlines	297	1,219,000	1,445	8,347,000	56,311	107,120	1,903,420*
Mohawk Airlines	328	1,428,070	1,149	27,116,000	162,078	172,916	2,861,262*
New York Airways	90	375,989	..	5,786	1,513	41,631	..
North Central Airlines	620	2,525,646	2,659	37,625,511	217,663	274,468*	..
Ozark Air Lines	384	1,750,000	2,708	20,343,000	124,445	104,220	3,327,557
Piedmont Aviation	743	3,015,000	2,733	56,769,172	269,773	434,180	5,744,618*
Pioneer Air Lines	396	1,842,542	1,972	40,750,223	146,859	320,906	3,646,540*
Southern Airways	412	1,707,549	1,912	19,286,489	112,328	167,819	3,241,834*
Southwest Airways	323	1,796,907	1,214	2,633,923	178,817	244,495	3,309,568
Trans Texas Airways	529	1,864,892	3,420	20,934,000	97,304	244,347	3,421,735
West Coast Airlines	370	1,800,000	2,025	3,509,253	161,614	114,308	3,319,434
MAIL & CARGO							
Flying Tiger Line	NA	NA	NA	NA	NA	37,741,124†	7,508,485
Slick Airways	NA	NA	NA	NA	NA	45,600,112†	9,117,098
Riddle Airlines	NA	NA	NA	NA	NA	13,584,611†	1,884,573
Helicopter Air Service	NA	NA	NA	NA	NA	29,889†	533,690
Los Angeles Airways	NA	NA	NA	NA	NA	54,760	824,809
New York Airways	NA	NA	NA	31,000	1,513	41,619	1,244,388

* Approximate

† Cargo ton-miles.

‡ Mail ton-miles.

NA Not applicable or unavailable.

Source: Adapted from *Aviation Week*, March 15, 1954, by permission

ing this group would have little meaning. The number of operators of various types of air services falling within this category, classified by type of operation in 1953, is shown in Table 19.

9. *Indirect Air Carriers.* This term is applied to the intermediaries between shippers and the operators of aircraft who are, nevertheless, considered to be "air carriers" under the definition contained in the Civil Aeronautics Act²² and are regulated by the Civil Aeronautics Board. The Railway Express Agency (Air Express Division) and various freight forwarding companies such as Emery Air Freight and the airlines' Air Cargo, Inc., come within this group of carriers.

TABLE 19
TYPES OF IRREGULAR AIR CARRIERS, 1953

Large irregulars and irregular transport carriers	56
Air taxi operators.	1375
Noncertificated cargo carriers.	3
Alaska pilot-owners	110
Noncertificated Alaskan air carriers.	9

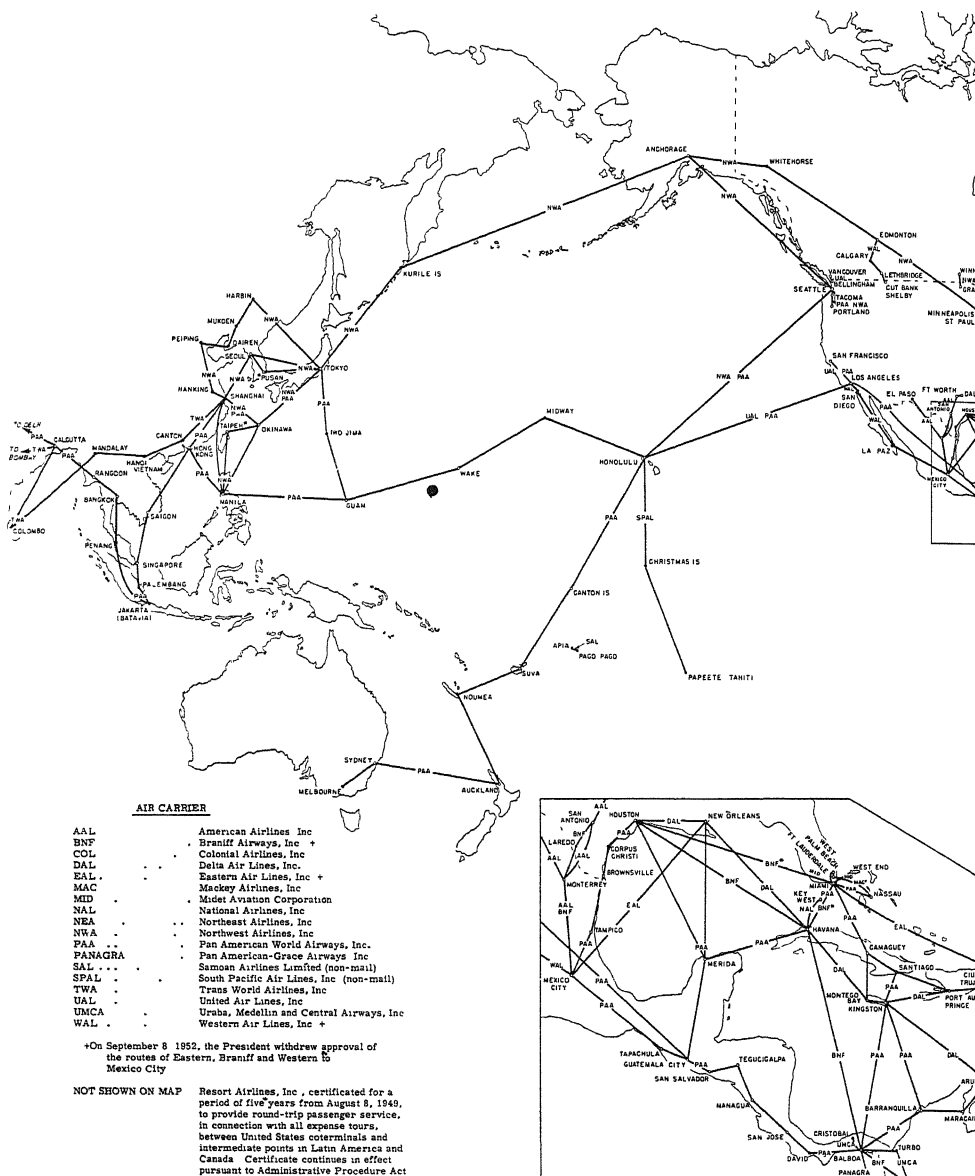
Source: CAB, *Annual Report, 1953* (Washington, D C. 1954).

Airline Route Pattern

The development of domestic air transportation has been largely influenced by the corporate route pattern established by the "grandfather" provisions in the Civil Aeronautics Act of 1938.²³ Future extension and development will likewise be vitally influenced by this established pattern. When that act was passed, the domestic system was made up of three roughly defined size groups: (1) the very large air carriers, commonly referred to as the "Big Four"—American Airlines, Eastern Air Lines, Transcontinental and Western Air (now Trans World Airlines), and United Air Lines; (2) the intermediate-size regional carriers, such as Northwest Airlines, Braniff Airways, Chicago and Southern Air Lines, Pennsylvania Central Airlines (now Capital Airlines), Delta Airlines, and Western Air Lines; and (3) the relatively small regional carriers, such as Inland Air Lines, Mid-

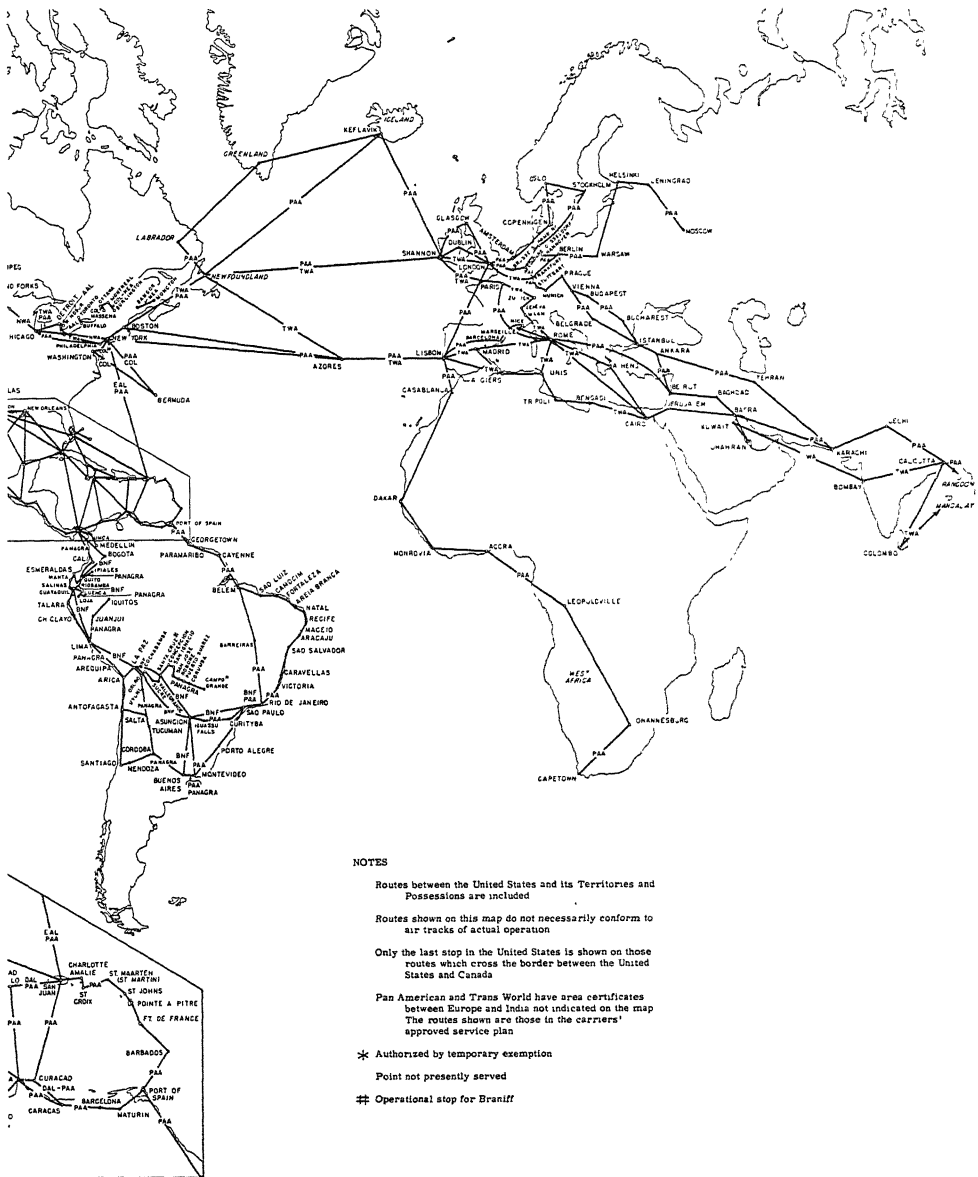
²² Section 1 (2) of the Civil Aeronautics Act of 1938 reads as follows: "Air carrier" means any citizen of the United States who undertakes, whether directly or indirectly or by a lease or any other arrangement, to engage in air transportation: *Provided*, That the Authority (now the Board) may by order relieve air carriers who are not directly engaged in the operation of aircraft in air transportation from the provisions of this Act to the extent and for such periods as may be in the public interest." See *Railway Express Agency, Inc., Grandfather Certificate Case*, 2 CAB 531 (1941); *Universal Air Freight Corp., Investigation of Forwarding Activities Case*, 3 CAB 698 (1942); *Air Freight Forwarder Case*, 9 CAB 473 (1948); *Air Freight Forwarder Case (International)*, 11 CAB 182 (1949).

²³ *Public Law No. 706, 75th Cong., 3rd sess., Sec. 401 (a).*



Source: Civil Aeronautics Board

FIG. 23. International air routes of United States Carriers.



NOTES

Routes between the United States and its Territories and Possessions are included

Routes shown on this map do not necessarily conform to air tracks of actual operation

Only the last stop in the United States is shown on those routes which cross the border between the United States and Canada

Pan American and Trans World have area certificates between Europe and India not indicated on the map. The routes shown are those in the carriers' approved service plan

* Authorized by temporary exemption

Point not presently served

Operational stop for Braniff

Continent Airlines, and Northeast Airlines. Mergers, route sales, and new route extensions have altered the 1938 situation considerably, particularly in groups (2) and (3).²⁴ The inherent problems presented in the "grandfather" pattern and its development have been further emphasized by the technological progress in aviation since the close of the war.

Many of the most difficult problems to be met in the future development of domestic air transportation will probably be the result of the conflict between the original route pattern and technological progress in aviation. The original route pattern was devised on the basis of the type of aircraft then being flown, the DC-2 and DC-3; and this flying equipment was, in general, better suited for regional operations than for long-haul operations, although by the end of the 1930's currently obtainable flying equipment had become too large for efficient operation on some of the small regional routes. Even today there are no aircraft ideally suited to operations on purely regional or on local-service routes.

In contrast to domestic route development, the United States international air route pattern has (with the exception of a few overseas and transborder international routes certificated prior to 1945) been established as the result of a comprehensively planned series of proceedings before the Civil Aeronautics Board.

Competition has arisen between United States and foreign-flag carriers both from extension of our carriers into new areas and from an increase in the number and extent of foreign-flag operations. (See Table 21.) The increased foreign-flag competition between the United States and cities abroad has resulted from the reciprocal exchange of operating permits between the United States and other governments.

Prior to the passage of the Civil Aeronautics Act in 1938, international air transportation, even more than domestic, had been developed through the award of air mail contracts by the Post Office Department. During this early period Pan American Airways (now Pan American World Airways) and Pan American-Grace Airways (Panagra) were the only United States-flag carriers in the international field.

Local-Service Airlines

The local-service airlines were certificated by the Civil Aeronautics Board after World War II to provide, on a regional basis, air service

²⁴ For current airline route maps see the latest monthly issue of *Official Airline Guide* (Chicago: American Aviation Publications). Northwest Airlines, for example, became the fourth carrier offering transcontinental service, and numbers fifth in size.

among the smaller communities and to link these small communities with major terminals. These airlines are now providing a necessary and important service in furnishing passenger, cargo, and air mail service to 440 such communities in the United States. Of these communities, 260 are served exclusively by the local-service airlines.

In the last eight years the local-service airlines have shown a tremendous growth. (See Table 15.) Their record has demonstrated the wisdom of the Civil Aeronautics Board in authorizing these carriers to provide service to the smaller cities in the country rather than using trunk airlines. In those cities previously served by trunk airline, local-service operators have substantially increased the traffic. One example is Johnstown, Pa., which was served in 1948 by one trunk carrier. In 1948 Allegheny Airlines, one of the local-service airlines, began service and the trunk airline suspended service. In its first year, Allegheny served more than 7,600 passengers at Johnstown. Five years later, in 1953, Allegheny enplaned more than 20,000 passengers at Johnstown and picked up and delivered 53,000 pounds of express and 40,000 pounds of mail.

Despite continuing growth of the local-service airlines, the Civil Aeronautics Board has thus far declined to grant permanent certificates to any of them. When the local-service airlines were first authorized, the policy of granting temporary certificates was justified since the program was experimental and the Board felt it necessary to determine which areas desired and would support the service. This experimental period is now over. The local airlines have demonstrated their usefulness to the public, and the public in turn has demonstrated its faith in them through increasing patronage.

In 1938, when the trunk air carriers in this country were in a comparable state of development, Congress enacted legislation giving them permanent certificates of "Grandfather rights." This action proved eminently successful and was instrumental in helping trunk airlines to increase their services tremendously, while at the same time substantially reducing their costs. It would appear that local airlines are now entitled to the same treatment Congress gave the trunk airlines.

Failure of the Civil Aeronautics Board to grant permanent certificates to local-service airlines is now seriously hampering their growth and has become a major stumbling block in their further development. Because of the temporary nature of their operating authority, the local airlines have found it hard to get adequate financing and have been forced to pay a higher price for whatever financing they have been able to obtain. This has forced these carriers to defer im-

provements in maintenance and navigational facilities which would enable them to make their service more regular and to reduce their operating costs. It is obvious that until the permanence of the local-service airlines is assured, investors and financial institutions will not risk substantial amounts of money in improvements which require more than a few years to be amortized.

A principal problem confronting the local-airline industry is the lack of a suitable aircraft. The aircraft being used almost exclusively by these carriers today—the DC-3—was designed approximately 20 years ago. It is operationally unsuited for short-haul air transportation and is becoming increasingly expensive to maintain. It has not been produced since World War II; replacement parts must generally be obtained through cannibalization of scrapped planes; and engine replacement has generally come from war surplus stocks. These factors point to the imperative need for the development of suitable substitute for the DC-3. The Civil Aeronautics Board's policy of only issuing temporary certificates, however, has tended to discourage the development of a replacement aircraft.

The shortcomings of the DC-3 in local service are largely responsible for the failure of these airlines to reduce their costs. This failure, in turn, has in many cases been cited by the Civil Aeronautics Board as an important reason for its refusal to grant permanent certificates. It can be seen that a vicious circle is at work here, since the development of a suitable DC-3 replacement (and, therefore, the reduction of costs) is dependent upon the guaranteed permanence of the local-service airlines.

Another problem of the local-service airlines is recruiting able employees. An employer who faces possible extinction every few years finds it difficult to attract personnel. Well-qualified men are naturally hesitant to join such an organization, and yet further development of the local airlines requires the highest caliber of personnel.

While the Civil Aeronautics Board was the sponsor of local-service airlines and continues to believe that the idea is sound, it has not supported permanent certification of such carriers because it has felt that: (a) permanent certificates would remove the incentive which these carriers now have to increase their revenues and hold down their costs; (b) it would make more difficult the improvement of the route systems of the several carriers; (c) it would saddle the government with an annual subsidy bill of over \$20 million for the indefinite future; and (d) the proportion of subsidy to total income is still

too high to warrant permanent certification of all carriers in the group.²⁵

Irregular-Service Air Carriers

Irregular-service air carriers are those which operate air transportation services under a letter of registration from the Civil Aeronautics Board by virtue of certain provisions²⁶ of the Board's Economic Regulations. The first such regulation, exempting nonscheduled operations, was adopted in 1938 shortly after the passage of the Civil Aeronautics Act, at which time nonscheduled air transportation was of little importance. Although there were many such operators, most of them were engaged to only a limited degree in air transportation—chiefly as a by-product of other services such as the sale and servicing of aircraft and accessories, aerial photography, flight instruction, aerial advertising, crop dusting, and the operation of airports.

Recognizing the possibility that such services might expand and become competitive with the certificated carriers, the Board took initial steps in 1940 to lay the groundwork for the future economic regulation of such air services. These early steps were confined to the gathering of information which would disclose the extent and nature of the traffic carried by nonscheduled operators; but since the activities of many of these operators was terminated by the war, the value of the information collected was not great. The wartime stimulus to aviation, the enlarged manufacturing capacity, the more general acceptance of air transportation, and the ultimate availability of surplus aircraft foreshadowed a tremendous growth in nonscheduled operations. And so shortly before the end of the war, the Board began an investigation of matters related to nonscheduled services, culminat-

²⁵ Statement of Chan Gurney, Chairman of the Civil Aeronautics Board, before the Senate Committee on Interstate and Foreign Commerce on bills to amend section 401(e) (2) of the Civil Aeronautics Act reported in *Traffic World*, August 7, 1954, p. 56. For another reflection of Board attitude pointing emphatically to the fact that it is not disposed to certificate local-service airlines permanently, see *Piedmont Aviation, Inc. Mail Rates*, CAB Docket No. 6363 (1954).

²⁶ Chiefly sec. 292.1, better known as the "nonscheduled exemption order." This defines an irregular carrier as one which "does not hold out to the public, expressly or by a course of conduct, that it operates one or more aircraft between designated points, or within a designated point, regularly or with a reasonable degree of regularity, upon which aircraft it accepts for transportation, for compensation or hire, such members of the public as apply therefore, or such property as the public offers. No air carrier shall be deemed to be an irregular air carrier unless the air transportation services offered and performed by it are of such infrequency as to preclude an implication of a uniform pattern or normal consistency of operation between, or within, such designated points."

ing on May 5, 1947, in the regulation now in effect. This regulation makes available to the public the advantages which properly operated services of this character offer, imposes a much greater degree of responsibility on the operators, and confines them within their own sphere with respect to their competitive relationship with the certificated carriers.

It was only after the close of the war that the volume of traffic carried by the nonscheduled operators reached substantial competitive proportions, and it was in the interval between the war's end and the time when the certificated carriers were able to augment their flight equipment that the nonscheduled carriers enjoyed their greatest prosperity. It was also during that interval that many of the nonscheduled carriers conducted services which were not contemplated by the Board's earlier regulation and which in frequency, regularity, and character of service approached the common carrier operations of the certificated airlines. However, as the latter were able to augment their cargo and passenger services, particularly with the introduction in 1949 of air coach service, the activities of the irregulars became less profitable, and many ceased operations for this reason. In addition, the Board instituted enforcement proceedings against a number of these carriers, resulting in the loss of their letters of registration so that they had to cease operations.²⁷

Another type of irregular or nonscheduled air carrier has been particularly concerned with air cargo. Until just before World War II the certificated air carriers were primarily interested in the development of the passenger business, even though there were some efforts to develop an all-freight service²⁸ in conjunction with air express.

In March, 1941, a number of the certificated airlines organized a corporation known as Air Cargo, Inc. Subsequently, all the domestic certificated carriers became cosponsors of this organization, which began an extensive research program into all phases of freight trans-

²⁷ See particularly *Page Airways, Inc., Investigation*, 6 CAB 1061 (1946); *Trans-Marine Airlines, Inc., Investigation*, 6 CAB 1017 (1946); *Transocean Air Lines, Inc., Enforcement Proceedings*, CAB Docket No. 3244 (1949); *Investigation of Seaboard and Western Airlines, Inc.*, CAB Docket No. 3346 (1949); *Standard Airlines, Inc., Investigation*, CAB Docket No. 3357 (1949).

²⁸ Following the passage of the Civil Aeronautics Act of 1938, Tri-State Aviation Corporation applied for and received a grandfather certificate authorizing the carriage of property only between Baltimore, Md., and Martinsburg, W.Va., via Morgantown, Elkins, Charleston, and Parkersburg, W.Va. That certificate was revoked in January, 1943, for failure on the part of the carrier to commence operations notwithstanding certain time extensions which the Board had granted. Since that time no certificate limited to the hauling of property only was issued until 1949, when experimental five-year authorizations were granted four "all-cargo" operators. See Chapters 7 and 16.

portation, such as air and ground equipment requirements, rates and tariffs, potential shippers, etc. The war required that many of the plans for an all-freight service be temporarily laid aside. Toward the close of hostilities, and particularly after the termination of the war in Europe, some of the equipment taken by the military forces was returned to the commercial airlines, and surplus military aircraft were placed on the market at bargain prices. Much of this equipment, although not the most feasible type, was nevertheless adaptable for freight operations, with only a minimum investment required for conversion of the aircraft. About this time the men released from the military air services entered the air freight field, using surplus equipment, for the most part, and began conducting so-called nonscheduled or contract operations over which the Board could exercise no control under the Civil Aeronautics Act.

The new operators almost immediately began developing air freight in considerable volume; but the nonscheduled or contract service, which they thought to be an advantage at first, soon proved undesirable. Shippers demanded a more regular service. A number of these new cargo carriers, therefore, petitioned the Board to operate as common carriers. The Board adopted a new exemption regulation, which permitted the nonscheduled carriers, subject to certain stipulated limitations, to conduct a scheduled common carrier service for a temporary period without a certificate.²⁹

However, with the certification of the strictly air cargo carriers in 1949, all other such carriers again became irregular operators faced with the alternative of (a) becoming small, strictly irregular operators operating within the Civil Aeronautics Board's definition of "irregular"; (b) limiting their operations entirely to contract flying, over which the Board had no jurisdiction; or (c) going out of business, which most of them did.

In 1952 there were 47 large irregular and 17 irregular transport carriers operating under a total of 64 letters of registration issued by the Civil Aeronautics Board.³⁰ A summary of their operations is shown in Table 20.

In 1951, the Civil Aeronautics Board started a proceeding which

²⁹ Economic Regulation 292.5.

³⁰ The difference between these two types of irregular service carriers is a legal one, the latter operating under specific CAB orders issued prior to September 1951, and the former on the basis of letters of registration filed with the Board and being considered by it in the *Large Irregular Investigation*, CAB Docket No. 5132. During the calendar year 1952 no operations were conducted under ten of the 64 letters and were conducted for only part of the year under eight other letters.

became known as the *Large Irregular Air Carrier Investigation*³¹ for the purpose of determining (a) the supplemental and additional air transportation role, if any, which the public interest required be assigned to the noncertificated air carriers using large aircraft; (b) which applicants should be authorized to conduct any required services; and (c) the rules and regulations under which they should operate. By the end of March 1955, this proceeding had reached the point of an examiners' report to the Board. This report recommended

TABLE 20
SUMMARY OF IRREGULAR SERVICE AIR CARRIER OPERATIONS
(Calendar Years 1949-52)

	1949	1950	1951	1952
Revenue passengers.	284,055	461,340	635,348	675,096
Revenue passenger miles . . .	581,708,000	769,768,055	1,074,865,000	1,246,187,796
Average length of haul. . . .	2,048	1,668	1,691	1,845
Cargo tons	19,667	20,423	35,108	27,692
Cargo ton-miles.	24,985,000	36,188,562	80,129,000	76,294,537
Average length of haul.	1,270	1,772	2,282	2,755
Transportation revenues. . . .	\$28,880,057	\$35,813,710	\$57,720,097	\$71,372,130
Total revenues	\$33,924,310	\$41,815,322	\$64,686,873	\$83,586,173
Total expenses.	\$34,916,239	\$40,734,117	\$61,472,411	\$76,606,671
Profit or () loss	\$ (991,929)	\$ 1,001,118	\$ 3,214,462	\$ 6,979,502

Source: Air Transport Association, *The Large Irregular Service Air Carrier Industry in 1952*, (Washington, D.C., 1953).

establishing irregular air carriers under a new designation of "Large Supplemental Air Carriers" authorized to engage in supplemental charter service and supplemental special service.³²

During the last few years there has been an increasing public demand for the services of a class of air carriers devoted to plane-load movements. Such a new service would be complementary to, but not

³¹ CAB Docket No. 5132 *et al.*

³² Supplemental charter service to be the transportation of persons or property under a plane-load contract on a flight for the charterer's own account between any two points in interstate, overseas, and/or foreign air transportation, subject to provisions that in transportation of persons and baggage the carrier may charter one half or more of the aircraft's capacity to one charterer and use the remainder to partially fulfill other charters of 50 per cent or more of plane capacity, and that supplemental charter air transportation of property may not be offered where certificated carriers conduct freight service with all-cargo aircraft, and to be permitted without restriction as to frequency or regularity. Supplemental special service to be the carriage of persons and property in interstate, overseas, and/or foreign air transportation to the extent of a maximum between any two points of three flights in each direction during any calendar month, subject to specified restrictions and conditions.

competitive with, the individual ticket and less-plane-load cargo service provided by the present airlines. In fact, over 57 per cent of all flights so far operated by the "nonskeds" have been plane-load charter operations and there is a very substantial demand for such operations both from business and the military.

The real charter potential has not even been tapped. Much of this is reflected by the general business flying segment of air transportation. In 1952, for example, 60,000 aircraft in this category flew 8.2 million hours, or about 972 million plane-miles, twice the volume of the domestic scheduled airlines. These aircraft flew only 138 hours each on the average per year, or less than half an hour daily (see Chapter 18). If adequate charter services by charter specialists were available, it is probable, in view of the high capital investment and operating costs of private business airplanes, coupled with the extremely low utilization, that much of the flying by company-owned aircraft would be performed by the charter carriers.

The certificated airlines, by reason of their established position, naturally are sought out in the first instance by groups interested in chartering aircraft, but are seldom in a position to fill the demand. As a general rule these carriers, because of their route requirements, are not staffed for, and consequently do not actively solicit, charter business. They do not assign aircraft exclusively to charter service, regard off-line charters as too costly to handle, and seldom assign personnel solely to the solicitation and development of charter business. The result is that scheduled airlines have often made use of the "nonskeds" for charter operations when unable to fill the demand themselves.

In addition to the unfilled civilian charter needs, the Department of Defense, which does not maintain a military air transport service adequate to meet all of its peacetime requirements, utilizes both scheduled and nonscheduled air carriers for movements of military passengers and cargo on a charter basis. Such charter services, during recent years, both international and domestic, have varied in nature from individual charter flights to extended contract operations. Generally, so far as cargo is concerned, the Department of Defense distinguishes between contract and charter operations, the former involving a definite commitment to a specified volume of operations for a substantial period of time, and the latter generally involving only one flight or a small number of flights. Charter flights may be booked at individual bases, either domestic or overseas. The major contract operations may involve either passengers or cargo. Passenger car-

riage for the Department of Defense may involve an organized movement of troops, or the carriage of personnel delayed for various reasons or on furlough where the Department is assuming the cost of the transportation.

There is clearly a place and a need in the air transport industry for a group of carriers specializing in charter services to fill vital peacetime and wartime requirements, both for industry and the military. The greatest single advantage of such a class of carriers would be its inherent flexibility. The equipment of scheduled operators is tied down quite rigidly to serving certificated points. It would be uneconomical for them to maintain a large amount of standby equipment and while some facilities are made available for special requirements beyond regular scheduled service, they are not always prepared to provide service on short notice to off-line points.

Helicopter Services

The newest form of air transportation in the United States is that provided by the helicopter operators in metropolitan areas. Fifteen years ago the helicopter was not seriously regarded as a practical commercial aircraft, but today it is generally regarded as something which may revolutionize short-haul commercial air transportation.

The Civil Aeronautics Board has authorized three local-service carriers to conduct a short-haul, common carrier service with helicopter equipment. The first of these was Los Angeles Airways which received authority from the Board to carry mail and property in 1947, an authority which was later expanded to include the carriage of passengers.³³ The Board later also certificated Helicopter Air Service to conduct mail and property operations by helicopter in the Chicago metropolitan area.³⁴ Still later, the Board authorized New York Airways to conduct rotary-wing operations for the carriage of passengers, property, and mail in the metropolitan area of New York City.³⁵ And in 1954 the Board authorized Mohawk Airlines, a local-service carrier, to operate one segment of its route system in the state of New York for a limited period by helicopter and also granted authority to National Airlines to conduct a limited helicopter service as a supplement to its trunk-line operation in the State of Florida. About 50 additional applications for helicopter operations were pending before the Board at the close of 1954.

³³ *Los Angeles Helicopter Case*, 8 CAB 92 (1947).

³⁴ *Chicago Helicopter Service Case*, 9 CAB 687 (1948).

³⁵ *New York City Area Helicopter Service Case*, CAB Docket No. 946 *et al.* (1950).

The metropolitan helicopter services differ from local-service airline operation, first, in type of equipment currently used. Second, the helicopter carriers operate through areas of high population density, whereas local-service carriers generally traverse areas of low density. Third, the helicopter hauls are shorter, and the frequency of service will eventually have to be considerably greater than that of the local-service group; for if flights are not readily available, there may be no time saving for the traveler or the shipper, who can easily resort to surface transportation. The local-service carriers, on the other hand, operate in areas where competing surface transportation is relatively slow and less frequent, and so do not have to meet this ground competition.³⁶

It is axiomatic in transportation that the cost of operation increases in inverse ratio to length of haul. New procedures for traffic handling and operation, therefore, will have to be developed to meet the requirements of high-density helicopter transportation if it is to be economically feasible. It will not be possible merely to put the helicopter into service on old transportation patterns.

Foreign-Flag Scheduled Carriers

The Civil Aeronautics Board has issued permits to 34 foreign-flag scheduled airlines allowing them to serve one or more points, usually on the borders of the United States or in our territories. These carriers are listed in Table 21.³⁷ Under their permits the foreign airlines may carry passengers, property (cargo), and mail. They may not accept traffic between points in the United States and/or its possessions.

Air Transport Association of America

The trade association of the certificated airlines of the United States is the Air Transport Association of America, with headquarters in Washington, D.C. It has a membership of 43 companies, which pool their technical and operational knowledge as well as their airline "know-how" born of years of experience and millions of miles of flying. The funds of the association are furnished by the members on a pro rata share according to their gross receipts. Its general policies and activities are the expression of the desire for joint action and a united front from its membership.

³⁶ Investment Bankers Association of America, *Local Service Air Transportation and Metropolitan Helicopter Services* (New York, 1954).

³⁷ See Chapter 10 for discussion of United States policy in permitting foreign-flag airlines to serve this country.

TABLE 21
FOREIGN-FLAG AIR CARRIERS OPERATING TO THE UNITED STATES, 1954

<i>Country</i>	<i>Name of Carrier</i>
Argentina	Aerolíneas Argentinas
Belgium	S.A. Belge d'Exploitation de la Navigation Aérienne (SABENA Belgian World Airlines)
Brazil	Emprêsa de Transportes Aerovias Brasil, S.A. (Aerovias Brasil)
British Commonwealth	British Commonwealth Pacific Airlines Ltd. (BCPA)
Canada	Canadian Pacific Air Lines Ltd. (CPAL) Trans-Canada Air Lines (TCA) Queen Charlotte Airlines, Limited (QCA)
Columbia	Aerovías Nacionales de Columbia, S.A. (AVIANCA)
Costa Rica	Líneas Aéreas Costarricenses, S.A. (LACSA)
Cuba	Aerovías "Q," S.A. (Aerovías "Q") Compañía Cubana de Aviación, S.A. (Cubana) Cuba Aeropostal, S.A.
Dominican Republic	Compañía Dominicana de Aviacion, C. por A. (CDA)
Ecuador	Aerovías Ecuatorianas, C.A. (AREA)
El Salvador	TACA International Airlines, S.A. (TACA El Salvador)
France	Compagnie Nationale Air France (Air France)
Honduras	Transportes Aéreos Nacionales, S.A. (TAN)
Iceland	Loftleidir H.F. (Icelandic Airlines Ltd.)
Israel	El Al Israel Airlines Limited (El Al)
Italy	Linee Aeree Italiane, S.A. (LAI)
Japan	Japan Air Lines Co. Ltd.
Mexico	Aeronaves de México, S.A. (Aeronaves) Aero-Transportes, S.A. (ATSA) Aerovías Guest, S.A. (Aerovías Guest) Compañía Mexicana de Aviación, S.A. (CMA)
Netherlands	Koninklijke Luchtvaart Maatschappij N.V. (KLM)
Philippines	Philippine Air Lines, Inc. (PAL)
Scandinavia	Scandinavian Airlines System (SAS)
Spain	Compañía Mercantil Anónima de Líneas Aéreas (Iberia)
Switzerland	Schweizerische Luftverkehr—AG. (Swissair)
United Kingdom	British Overseas Airways Corporation (BOAC) British West Indian Airways, Ltd. (BWIA)
Venezuela	Línea Aeropostal Venezolana (LAV) Rutas Aereas Nacionales, S.A.

The association's activities are carried on by the following departments or committees: operations and engineering, air navigation and traffic control, traffic or sales, economic research, governmental affairs, finance and accounting, legal, and public relations.

Military Air Transport Service

While not strictly a part of the commercial or business air transportation of this country, the Military Air Transport Service, which was established on June 1, 1948, is an important part of the total commercial aviation industry. As shown in Table 22, the thousands of

TABLE 22
MATS WORLD-WIDE ESTIMATED OPERATIONAL STATISTICS
(June 1, 1948 to June 1, 1953)

Passengers airlifted*	1,650,000	Passenger miles flown	3,200,000,000
Medical patients airlifted	240,000	Patient miles flown	650,000,000
Total: Passengers and patients airlifted	1,890,000	Total: Passenger and patient miles flown	3,850,000,000
Tons cargo and mail airlifted* . .	316,000	Patient movements world-wide	418,000
Total tons (includes tons of passengers, patients, cargo, and mail airlifted)	526,000	Total ton miles (includes passenger and patient ton- miles and cargo and mail ton-miles flown)	1,000,000,000

* Since August, 1952, includes only traffic moved world-wide in overseas areas outside U.S.
Source: Public Information Division MATS, news release, June, 1953.

passengers and tons of air cargo carried are thereby diverted from commercial carriers and should be considered in total air transport activities.

MATS is a world-wide air route command whose primary mission is to provide scheduled and strategic airlift support to the Department of Defense. This is provided by its three transport divisions: Continental, Pacific, and Atlantic Divisions, operating in their respective geographic spheres. Another purpose of MATS is to develop a strong military air transport facility "in being" to provide logistical support or airlift capabilities to meet an emergency of a mobilization or war-readiness nature. MATS also provides technical services for the entire United States Air Force, and for other military and civil aircraft, as follows: Airways and Air Communications Service, Air

Weather Service, Flight Service, Air Resupply and Communications Service, and Air Photographic and Charting Service.

The present route patterns of MATS largely parallel those of scheduled United States commercial airlines on the international and domestic routes. This becomes inevitable, in most instances, as the availability of airways and air communications services dictate that air traffic move in the same channels. Exceptions where MATS is the sole route operator are very limited and include service to such areas as Thule, Greenland, and points in Northern Canada and the Arctic regions.

MATS does not make a deliberate offer of domestic service in this country. Nevertheless, positioning its equipment for overseas operations offers lift capacity and a substantial volume of traffic is generated directly and confined to the United States.³⁸ There can be no question that in positioning aircraft by fitting them into a domestic scheduled pattern, particularly when high-class equipment of the DC-6 type is operated, considerable traffic, both passengers and freight, is generated within this country. As of June 30, 1954, MATS operated a total of 536 airplanes of which 425 were four-engine.³⁹

³⁸ For example, service is provided from Brooks Air Force Base (San Antonio, Texas) to Fairfield, California, via El Paso and Albuquerque. Another flight originating at San Antonio continues to Westover, Massachusetts, via Mobile, Alabama, and Washington, D.C.

³⁹ Commission on Organization of the Executive Branch of the Government, *Subcommittee Report on Transportation* (Washington, D.C., 1955).

Chapter

4 * REGULATORY AGENCIES

THE development of a body of law regulating the use of the air as a medium of transportation was at first hampered by legal uncertainty. Those who were most interested in aviation sought a means whereby the right of flight and the regulations governing the conditions of flight might be made by the federal government, unhampered by state regulations. Another group, and by far the larger, having neither interest in nor desire to use the air as a highway, feared the effect of its use in this manner; and, remembering the historic limitations on the federal power to regulate commerce, as evident in the development of the railroads, this group actively opposed or urged caution in making any federal law on aviation.

There was also a considerable group who maintained that the air was analogous to navigable waters and that, therefore, a law controlling its use could be invoked under the admiralty powers of the federal government. A constitutional amendment was also suggested. General use of the airplane, requiring some sort of regulation, arrived before there was any unanimity of legal thought on what kind of law would be best. This confused situation resulted in a multiplicity of statutes, both state and federal.

Federal regulation of air transportation may be traced primarily to the efforts of the aircraft industry, the work of the Committee on the Law of Aeronautics of the American Bar Association, and the appointment by Congress of a number of different aircraft investigating committees and boards after the entrance of the United States into World War I. One important bill introduced in Congress, the Civil Aeronautics Bill of 1923, failed to be reported out of committee. Two of the Congressional investigating committees are of special importance, for their reports were the immediate forerunners of the Air Commerce Act of 1926. The Select Committee of Inquiry into the Operations of the United States Air Services (the Lampert-Perkins Committee) was appointed in March, 1924; and the President's Aircraft Committee was appointed in September, 1925, to report upon

the best means to develop and apply aircraft to national defense. The scope of inquiry by the latter committee was sufficiently broad to enable it to consider all phases of air transportation and to assist Congress in the development of a legislative program to promote civil air transportation, as well as to formulate a five-year program for developing military and naval aviation.¹

Arguments were advanced for federal control of aviation under the constitutional powers of Congress to establish post roads and to provide for the common defense. Much of the power of the present law in establishing airways rests on the postal power. Another argument for federal control, to the virtual exclusion of state regulation, was based on the interpretation of the commerce clause of the Constitution, known as the "uniformity of regulation" theory. This theory first appeared in the case of *Cooley v. Port Wardens*² in 1851 and continued to be recognized in an unbroken line of decisions by the Supreme Court of the United States. These cases point out that a field exists in which the federal government may act under the interstate commerce power because, factually, the problems are so inherently national in character that they require uniformity of regulation affecting all the states alike.³

When the legal problems of flying first arose, it was not as plain as it is today that aviation, in all its phases, is inherently national in character. To have applied the uniformity of regulation theory then, Congress and the courts would have had to concede that aviation did not admit of state control. In those days Congress and the courts did not foresee the high-altitude transcontinental aircraft or even the

¹ See M. W. Willebrandt, "Federal Control of Air Commerce," *Journal of Air Law and Commerce*, July, 1940; O. Ryan, "Federal and State Jurisdiction over Civil Aviation," *Journal of Air Law and Commerce*, January, 1941; J. H. Hamstra, "Two Decades—Federal Aero-Regulation in Perspective," *Journal of Air Law and Commerce*, April, 1941; George W. Starr, "The Position of the State in Economic Control and Regulation of Air Commerce," *Journal of Air Law and Commerce*, Spring, 1948; Emory T. Nunneley, Jr., "Federal Aviation Legislation," *Journal of Air Law and Commerce*, Autumn, 1947; Frederick A. Ballard, "Federal Regulation of Aviation," *Harvard Law Review*, October, 1947; John C. Cooper, "State Sovereignty vs. Federal Sovereignty of Navigable Airspace," *Journal of Air Law Commerce*, Winter, 1948.

² 12 How. (U.S.) 299, 13 L. ed. 996. This argument was strongly advanced by Mabel W. Willebrandt, Chairman, Committee on Aeronautical Law, American Bar Association, *op. cit.*

³ See comment note to *Kelly v. Washington* (302 U.S. 1), 82 L. ed. at p. 14, for other examples. *Mobile County v. Kimball*, 102 U.S. 691, 26 L. ed. 238 (1881) (cases involved improvement of harbors by state): "Here there can of necessity be only one system or plan of regulation, and that Congress alone can prescribe." *Missouri ex rel. Barrett v. Kansas Natural Gas Co.*, 265 U.S. 298, 68 L. ed. 1027 (1931): "The paramount interest [moving of natural gas from producing field] is not local but national—admitting of and requiring uniformity of regulation."

small private planes with a cruising range far wider than state lines. If, however, the question were first propounded now, there would probably be general agreement that aviation is inherently national.

*The Air Commerce Act of 1926*⁴

The first federal law dealing with aviation was the Air Commerce Act of 1926, enacted to stabilize civil or commercial aviation so that it might attract adequate capital and to provide aviation with the assistance and legal basis necessary for its development. This law, for the first time in our history, stated the relationship of the federal government to the development of civil air transportation and provided largely for aid and encouragement rather than for regulation. The law was, in other words, intended to help civil aviation to develop rather than to regulate any existing objectionable practices.

The Air Commerce Act contained the following principal provisions:

1. All aircraft owned by United States citizens must be registered before being operated from one state to or over another state in common carrier service or in connection with any business, including intrastate business.

2. Registered aircraft could not be operated anywhere unless properly certificated and operated by a duly certificated airman.

3. The Secretary of Commerce was authorized to establish air traffic rules, which were to govern all aircraft operating in the United States, whether or not between states and whether or not in "commerce."⁵

4. The Secretary of Commerce was authorized to establish lighted civil airways, i.e., routes "in the navigable air space designated . . . as suitable for interstate or foreign air commerce."

5. The act was to be enforced through a system of civil penalties similar to those used in enforcing the customs and water navigation laws.

⁴ 44 Stat. 568 (1926). The best source of general information on this Act is F. P. Lee, *Legislative History of the Air Commerce Act of 1926* (1928 revision of 1923 edition of *Law Memorandum upon Civil Aeronautics*) (Washington, D.C.: U.S. Government Printing Office, 1928).

⁵ The jurisdictional scope of the air traffic rules was stated in this manner in *House Report No. 1162, 69th Cong., 1st sess.* (1926), p. 2. The original air traffic rules were held applicable to intrastate flights in *Neiswonger v. Goodyear Tire and Rubber Co.*, 35 Fed. (2d) 761 (N.D. Ohio, 1929). The act of 1926 was held applicable to "all types of flying" in *Sen. Report No. 185, 75th Cong., 1st sess.* (1937). p. 30.

No new "bureau" was established for carrying out the provisions of this act. Rather, the new work was distributed among the various existing agencies of the Department of Commerce, with only the regulatory and informational functions requiring a new subdivision. This subdivision was first known as the Aeronautics Branch; but in 1934 the loose organization of this branch was consolidated into a Bureau of Air Commerce, under a Director of Air Commerce.

With minor amendments in 1934,⁶ primarily intended to strengthen federal authority over the airlines, the Air Commerce Act provided, until 1938, the only federal regulation of aviation. Under it three separate agencies of the government had control over vital phases of civil aeronautics regulation: (1) The Bureau of Air Commerce of the Department of Commerce regulated safety and exercised certain promotional functions. (2) The Post Office Department, through the letting of air mail contracts, exerted substantial economic control over the airlines. (3) The Interstate Commerce Commission, through its authority to fix rates for the carriage of mail and to exercise certain regulatory functions, exerted further economic control over the airlines. The result of this divided jurisdiction over civil aeronautics was a lack of co-ordination in the efforts of the government to regulate, foster, and develop the air transportation industry and miscellaneous flying. This proved a burden upon the air carriers and private fliers and increased the work and detracted from the efficiency of the government itself in this field.

In this period there were also several laws passed, namely the Kelly Act and amendments and the Watres Act, having to do mainly with air mail (see Chapter 8).

The Civil Aeronautics Act of 1938⁷

Beginning in 1934, the air carriers themselves sought federal regulation, realizing that the history of transportation demonstrated that the absence of such regulation led to evils from which not only the public, but the industry itself, would suffer. It was in that year that the whole air transport industry was thrown into confusion when all federal mail contracts were canceled because of alleged collusion between the mail carriers and post office officials and other abuses under the Watres Act (Mail Pay Act) of 1930, the Army was ordered to

⁶ Air Mail Act of 1934, 48 Stat. 1113 (1934).

⁷ 59 Stat. 977 (1938). See C. S. Rhyne, *The Civil Aeronautics Act Annotated* (Washington, D.C.: National Law Book Co., 1939); A. J. Thomas, Jr., *Economic Regulation of Scheduled Air Transport* (Buffalo, N.Y.: Dennis & Co., Inc., 1951). See also Appendix A.

fly the mail. In July, 1941, a commissioner of the United States Court of Claims reported that there was no fraud in the air mail contracts canceled in 1934, leaving the way open for the airlines, whose contracts were canceled at that time, to claim damages from the government of about \$2,500,000 (see Chapter 3).

Also, since the Act of 1926 had been passed before air transportation of passengers and mail had developed into a business enterprise, there was a growing sentiment that the law had become outmoded, particularly because it made no provisions for the regulation of the services, rates, and charges of common carrier airlines. Even so, the airlines then in existence had not developed any well-defined faults to which legislation could be specifically directed. Congress, therefore, drew upon its experience in handling the problems of surface transportation, assuming that such experience furnished a reasonably sound guide for anticipating the problems of air transportation. The new act it provided came in its essentials straight from Part I of the Interstate Commerce Act of 1887 and the Motor Carrier Act of 1935.

The principal provisions of the Civil Aeronautics Act of 1938 were as follows:

1. It substituted one federal statute and agency for the several which had been regulating the industry. An administrative agency was set up consisting of three practically autonomous bodies in an attempt to draw a line of demarcation between executive, legislative, and judicial functions.

The bodies within this agency were: a five-man Authority, a three-man Air Safety Board, and an Administrator. Members of these bodies were appointed by the President with the advice and consent of the Senate. Within these groups was vested the entire regulation of civil aviation, split into three parts: (1) The five members of the authority exercised quasi-judicial and quasi-legislative functions covering economic and safety regulations. (2) The administrator exercised purely executive functions covering development, operation, etc., of air navigation facilities and general development and promotional work. (3) The air safety board was an independent body for the investigation of accidents.

The Civil Aeronautics Authority began operations in September, 1938. For the first time, all branches of the aeronautics industry were able to lay plans for the future and to adopt long-range programs based upon sound economic principles. For the first time they found it feasible to co-operate with each other (which was in part due to the fact that the Civil Aeronautics Act of 1938 exempted the airlines

from the antitrust laws) and with the federal government in the attainment of common objectives for advancing the industry on all fronts. It seemed reasonable to suppose that the airlines and others concerned would look to this one source for whatever regulation was provided by law and that this source would remain the same as long as the system worked. However, President Franklin D. Roosevelt, in April, 1940, transmitted Reorganization Plans 3 and 4 to Congress, and these became effective on June 30, 1940.⁸

Plan 3 changed the title of the Administrator of the Civil Aeronautics Authority to Administrator of Civil Aeronautics and transferred to him various administrative functions originally vested in the five members of the Authority, including the administration of safety regulation. The members of the Authority, however, were to continue to prescribe safety regulations and, after proper hearings, were to suspend or revoke certificates for airmen, aircraft, and facilities. Plan 4 placed the entire Authority within the framework of the Department of Commerce, abolished the Air Safety Board, and changed the name of the five-member Authority to Civil Aeronautics Board. The investigation of accidents, which had been performed by the Air Safety Board, was thereafter to be handled by the Bureau of Safety Regulation of the Civil Aeronautics Board. The Administrator of Civil Aeronautics were placed directly under the Secretary of Commerce; the Civil Aeronautics Board, however, while within the Department of Commerce for purposes of budgeting, personnel, and other routine management functions, was to continue its functions of rule-making, adjudication, and investigation independently.

Because of the similarity in the initials of the Board and the Administrator and because both were concerned with civil aviation, some confusion as to identity and function resulted from the reorganization. This was due, at least in part, to the practice of designating federal agencies alphabetically. The term "CAA," which originally meant the Civil Aeronautics Authority, has subsequently come to mean the Civil Aeronautics Administration. This confusion of identity, however, is gradually disappearing, as the term "Authority" is fading into disuse and the functions of the old Authority, which are now exercised by the Board, are attributed to the "CAB."

Another misconception has arisen at times regarding the relationship between the five-member Board and the five-member Civil Aero-

⁸ Plan 3 will be found in 5 Fed. Reg. 2107 (1940). Plan 4 will be found in 5 Fed. Reg. 2421 (1940). These plans were submitted by the President pursuant to the Reorganization Act of 1939 (55 Stat. 561 [1939]). See also Appendix A.

navitics Authority which existed before the reorganization. It is incorrect to refer to either the Board or the Administrator as the "successor" to the Authority. The idea of succession implies that the former agency was superseded by the creation of a new agency, and this was not the case. The Civil Aeronautics Board is the same agency as the five-member body which existed prior to the reorganization. With the mere change of name from "Authority" to "Board," the identical agency continued with its same membership unaffected by the organization order. The reorganization affected a change in name and an increase of powers in some respects and a curtailment in others, but the reorganization did not amount to the abolition of the previous agency or the creation of a successor.

Still another misunderstanding exists about the relationship which the Board and the Administrator bear to the Department of Commerce. The *original* "CAA" was not part of the Department of Commerce or any department, but the Civil Aeronautics Administration now is an office of the Department of Commerce. The Civil Aeronautics Board, however, is an independent agency reporting directly to Congress and exercises its power independently. The Board's decisions are not subject to review by the Department of Commerce or any executive department or agency, with the single exception that the President's approval is required on Board decisions which affect international air transportation. The Board appoints and controls its own staff, authorizes its own expenditures, determines and supports its own budget estimates, and promulgates its policies and decisions independently.

The Civil Aeronautics Board is the independent agency of the federal government which exercises legislative, regulatory, and judicial powers over American civil aviation. On the other hand, the Civil Aeronautics Administration of the Department of Commerce is the executive agency of the federal government in civil aviation, carrying out the enforcement, operational, and promotional functions delegated to it by the Act of 1938.⁹

2. The Act of 1938 set forth a statement of policy which requires the Civil Aeronautics Board to regulate air transportation in the public interest, giving consideration specifically to certain objectives: (a) to encourage and develop an air transportation system adapted to the present and future needs of domestic and foreign commerce, the postal service, and national defense; (b) to regulate air transportation so as to preserve its inherent advantages, promote the highest de-

⁹ See Joseph J. O'Connell, Jr., "Civil Aeronautics Board," *Air Affairs*, Autumn, 1949.

gree of safety and sound conditions in the industry, improve relations among air transport companies, and co-ordinate transportation by air carriers: (c) to promote adequate, economical, and efficient transportation service by air carriers at reasonable charges (unjust discriminations, undue preferences or advantages, and unfair or destructive competitive practices being specifically prohibited); (d) to regulate the industry so as to preserve competition to the extent necessary to assure the sound development of an air transportation system for commerce, the mail service, and national defense; (e) to regulate the industry in such a manner as to promote the development of air commerce and to promote safety; and (f) to encourage and develop civil aeronautics.

3. The Act of 1938 provided for extensive regulation of the economic activities of air carriers as follows:

(a) No person or company, except as they may be exempted from the economic provisions of the act by Board order,¹⁰ may engage in air transportation nor may any new points be served by an air carrier,¹¹ without appropriate authorization by the Civil Aeronautics Board in the form of a certificate of public convenience and necessity issued to a carrier found "fit, willing and able"¹² to effectuate a proposed operation in the public interest.¹³ Under the so-called "grand-

¹⁰ Civil Aeronautics Act, sec. 416 (b). See Appendix A.

¹¹ Civil Aeronautics Act, sec. 401 (a). Under the terms of the Act, the Civil Aeronautics Board has held an "air carrier" to be one who undertakes, whether directly or indirectly or by a lease or any other arrangement, to engage in the carriage by aircraft of persons or property as a common carrier for compensation or hire, or the carriage of mail by aircraft, in commerce between the geographical areas stated in section 1 (21) of the Act. Viewing this language in the light of the entire context and purpose of the Act, it seems to have the effect of dividing air carriers into two classes, one consisting of those who undertake directly to engage in the carriage by aircraft of persons, property, or mail, and the other of those who undertake, indirectly or by lease or some other arrangement, to engage in the carriage by aircraft of persons, property, or mail. Whether the undertaking be direct or indirect, the engagement must be the carriage of persons, property, or mail by aircraft as a common carrier. See CAB Orders, Serial No. 940, Docket No. 19-491 (E) 1. (The Board has no control over contract carriers nor over intrastate carriers.)

¹² "The Act does not define 'fit, willing and able' but the Board has established these tests: (1) a proper organizational basis for the conduct of air transportation; (2) a plan for the conduct of the service made by competent personnel; (3) adequate financial resources" (*Braniff Airways v. Civil Aeronautics Board*, 147 Fed. [2d] 152, 153 [App. D.C., 1945]).

¹³ An analysis of the Board's decisions on applications to operate competing services or new routes (other than local or feeder line services) indicates that the Board has consistently weighed three primary factors in determining the paramount public necessity or interest in each fact situation presented. These are: (1) the benefit to the public from the new services, (2) the financial and economic interest of the air carriers involved, and (3) the desirability of competition. It seems well established that the Board is the sole arbiter of the paramount public interest in domestic cases (*United Air Lines v. Civil Aeronautics Board*, 155 Fed. [2d] 169 [C.C.A. D.C., 1946]). In international cases the Board is the sole arbiter as the President's adviser (*Pan American Airways, Inc. v. Civil Aeronautics Board*, 121 Fed. [2d] 810 [C.C.A. 2d 1944]).

father” clause¹⁴ of the act, provision was made issuing certificates of convenience and necessity for routes on which carriers could show that they had supplied adequate and continuous service from May 14 to August 22, 1938, the effective date of the act. Routes once established may not be abandoned by airlines without express approval of the Authority. Air carriers must provide adequate facilities for the transportation of mail upon request of the Post Office Department.

(b) Foreign air carriers may not engage in transportation to or within the United States unless a permit has been issued by the Board.

(c) Air carriers are required to publish tariffs of rates and charges for transportation of persons or goods and to file these tariffs with the Board. No departure from these tariffs is permitted, rebating being prohibited. Changes may not be made in airline tariffs upon less than thirty days’ notice, unless specifically permitted by the Board. The division of joint rates and fares to which air carriers are parties must also be filed with the Board if required by that body.

In regulating the rates of air carriers the Board is required to take into consideration, among other factors: (1) the effect of the rates upon the movement of traffic; (2) the need in the public interest of adequate air transport service at the lowest rates consistent with such service; (3) the standards of air transport service prescribed by law; (4) the inherent advantages of transportation by aircraft; and (5) the need of each air carrier for revenue sufficient to enable such carrier under honest, economical, and efficient management to provide adequate and efficient air carrier service.¹⁵

(d) The Board has complete jurisdiction over awarding and terminating air mail contracts for domestic and foreign air mail services, and over the air mail schedules, maximum mail loads, and fair and reasonable compensation for air mail services.¹⁶

(e) Air carriers are required to submit accounts, records, and reports to the Board annually. True copies of all contracts to which air carriers are parties must also be filed.

(f) The Board has jurisdiction over the consolidation or merger of control of air carriers in connection with other air carriers or other aeronautical businesses. Interlocking directorates and other commu-

¹⁴ Civil Aeronautics Act, sec. 401 (e). See Appendix A.

¹⁵ Civil Aeronautics Act, sec. 1002 (e). See Appendix A.

¹⁶ “In determining the rate (for the carriage of air mail) in each case the Board shall take into consideration . . . the need of each such carrier for compensation for the transportation of mail sufficient to insure the performance of such service, and, together with all other revenues of the air carrier, to enable such air carrier under honest, economical, and efficient management, to maintain and continue the development of air transportation . . .” (Civil Aeronautics Act, sec. 406[b]). See Appendix B.

nities of interest are forbidden except upon express approval. Pooling arrangements to which air carriers are parties must be submitted to the Board for approval and may be approved only if shown not to be adverse to the public interest or in violation of the Civil Aeronautics Act.

4. The Act of 1938 provided for a continuance of registration of aircraft by the Civil Aeronautics Administration; for the issuance of certificates of nationality for aircraft; for registration of engines, propellers, and aircraft appliances; for recording ownership of aircraft; for regulation of minimum safety standards; and for certification of airmen and aircraft.

5. The Administrator of Civil Aeronautics is empowered to issue air carrier operating certificates¹⁷ and to establish minimum safety standards for such operations, as well as to set standards for maintenance of equipment, inspection of equipment, the rating of air navigation facilities, and the rating of civilian air schools, repair stations, and other agencies. The supervision of aviation education and general aviation development, including the promotion of personal flying, is also vested in the Administration.

*Proposed Changes in the Civil Aeronautics Act of 1938*¹⁸

Early in 1954 a Senate bill was introduced (S.2647, 83rd Cong. 2nd sess.) which proposed a complete revision of the basic aeronautical laws of the United States. Although this bill, in general form, followed the outline of the Civil Aeronautics Act of 1938, there were a great many substantive changes and a multitude of drafting modifications over the earlier act. (The most important of these changes are listed in Appendix B.) Similar bills were introduced in both the House and Senate early in 1955.

The Civil Aeronautics Act of 1938 had been in effect for approximately 15 years by 1954 and it was basically the same as when enacted except for certain amendments both administrative and substantive in nature. The public, the air carrier industry, and the government as a whole, including Congress, had become accustomed to the method and manner of dealing with civil aeronautics as set out in the

¹⁷ The "air carrier operating certificate" should not be confused with the "certificate of convenience and necessity." The operating certificate is issued to indicate that the carrier is fit to operate; that its pilots are familiar with the route to be flown and airports to be used; and that its equipment, communication facilities, and maintenance and other operating facilities meet Civil Aeronautics Administration standards. The certificate of convenience and necessity has nothing to do with operations as such.

¹⁸ See Appendix B.

1938 Act, and were familiar with the problems arising under it and with handling them on a day-to-day basis. Moreover, the Act had been interpreted by some 100 court cases, and each case to a greater or lesser degree helped fix the meaning of the statute. There had been 12 volumes of administrative decisions issued by the Board and published in this field. This case law and administrative action had served to give greater definition to the provisions of the original Act, thus making action more sure and possibly more predictable. For these reasons it was felt by the air carrier industry and the Civil Aeronautics Board that changes in the industry during the 15-year life of the Civil Aeronautics Act were not in and of themselves a sufficient warrant for rewriting the entire Act, nor did there appear to be any crying need for extensive revision. Certain amendments to the Act of 1938 would, however, be desirable.¹⁹ These are discussed in more detail in later chapters, but may be summarized as follows:

1. Under the Act of 1938, the Civil Aeronautics Board has no economic regulatory jurisdiction over contract carrier operations. Accordingly, such operations can now be conducted without regulation as to the extent or character of service, rates charged, or other economic aspects of operation. In the charter field, the line of demarcation between common and contract carriage is not always clearcut. Hence, it appears desirable for the Board to have an extension of its economic authority to cover contract carriers.

2. At the present time the Board does not have any control over issuing air carrier securities. Control over the issuance of railroad securities has been vested in the Interstate Commerce Commission since 1920. The Board believes that there is even more reason for the regulatory agency in charge of air carriers to have this authority than there is in the case of surface carriers. This is because air carriers, in part at least, need subsidy from the federal government; it therefore seems a matter of simple wisdom that the issuance of securities should be subject to the approval of the Board, who can thus ensure that unwise investment and security dealings do not destroy that which the government, through subsidy, has helped to build up (see Chapter 12).

3. Many believe that the Board should be granted jurisdiction over the rates in foreign air transportation. For the most part such rates are now set by the International Air Transport Association

¹⁹ See statements of Stuart Tipton for the Air Transport Association of America and Chan Gurney, Chairman of the Civil Aeronautics Board, before the Senate Interstate and Foreign Commerce Committee relative to its hearings on S.2647, May-June, 1954.

(IATA). This is an international organization of carriers, and governments as such are not entitled to participate directly (see Chapter 10).

*Organization and Functions of the Civil Aeronautics Board*²⁰

The Civil Aeronautics Board is composed of five members, each being appointed for a six-year term by the President, subject to the approval of the Senate. The terms of the members do not run concurrently, but are staggered so that each term expires at the end of a different year. These five men are responsible for carrying out the functions assigned the Board by the Civil Aeronautics Act. They may act with a quorum of three and by a majority vote of the members present. They each receive a basic salary of \$15,000 per year.

A full understanding of the Civil Aeronautics Board requires a comprehension of the various functions performed by it and its staff. The duties of the Board are a composite of legislative, judicial, and executive functions. Some of these may readily be tagged with an appropriate label; others involve a combination of legislative, judicial, and executive functions, so that it is impossible to separate one from the other. All functions, however, are carried on in accordance with primary standards laid down by Congress.

Legislative Functions. The Board has two responsibilities, at least, which may clearly be labeled legislative. These are the promulgation of the Economic Regulations and Civil Air Regulations. Such regulations have the force of law, are prospective in effect, and treat all members of the class affected without discrimination. In the Economic Regulations are to be found the rules which govern the economic life of air transportation operations by United States air carriers, and, in a limited way, by carriers of other countries flying into the United States. They provide for such matters as the proper method of keeping records, of furnishing reports, and filing tariffs.

The Civil Air Regulations are broader in scope than the Economic Regulations, since they govern not only United States air transport operation, but all civilian flying within the country, including operations of foreign aircraft to the extent made applicable therein. The Civil Air Regulations establish detailed rules relating to the airworthiness certification of aircraft and their production, and of pro-

²⁰ See O'Connell, Jr., *op. cit.*; "Airline Industry Investigation," *Hearings before Committee on Interstate and Foreign Commerce, U.S. Senate* (81st Cong., 1st and 2d sess.) (Washington, D.C., 1949), Part 5, "Staff Report of the Civil Aeronautics Board," by Edward C. Sweeney; Delos W. Rentzel, "U.S. Regulation and the C.A.B.," *IATA Bulletin*, June, 1951.

pellers and appliances. They prescribe the standards of pilot qualification and qualification for other airmen certificates, and establish detailed rules for the safety of air carrier operation. They also provide the air traffic rules and rules for reporting accidents.

Both sets of regulations are strictly legislative in nature. The Board is required under law, however, to publish the proposed regulations in the *Federal Register*, to solicit comments from the public on the proposed rules, and to consider such comments before finally promulgating the regulations. However, it is not required to hear witnesses or take evidence or listen to argument in behalf of, or against, any such proposal. There is much similarity between this practice of the Board and that followed by Congressional committees when they are considering legislation.

Judicial Responsibilities. The Board has only two functions which may clearly be labeled as judicial activity. These functions are, on the one hand, the revocation of economic certificates of public convenience and necessity, and the revocation of airmen, airworthiness, and other safety certificates; and, on the other, issuance of cease and desist orders directing a carrier or ticket agent to refrain from engaging in unfair or deceptive practices or unfair methods of competition.

The reasons for revoking each type of certificate differ. In the case of the economic certificates, revocation may be ordered only for intentional failure to comply with any of the economic provisions of the Civil Aeronautics Act or with any rule, regulation, or term of a certificate issued under the economic provisions of that Act. Even then, the certificate may not be revoked until the offending airline has been given an opportunity to comply with the provisions which the Board has found it to have violated. In the case of the safety certificates, however, the Board may revoke airmen, airworthiness, and air-carrier-operating certificates for any cause which at the time of revocation would justify the refusal to issue a like certificate to the defendant. No "second chance" need to be given.

The issuance of cease and desist orders in unfair competition cases is likewise clearly a judicial function. In these cases the Board is called upon to determine whether there has been a violation of law in the methods of competition used, and if such is found to be the case, to direct that such practices be stopped.

In each of these spheres of activity, the Civil Aeronautics Act, reflecting the due process clause of the Constitution, requires that the Board afford the defendant a full opportunity to be heard, to present

evidence and proof on his own behalf, and to have the case tried in an impartial manner. This is done in the first instance by one of the examiners from the Bureau of Hearing Examiners. After the case has been heard, the examiner prepares his decision, to which the parties to the proceeding may file formal objections. These objections are considered by the Board, and the examiner's decision may be either affirmed, modified, or overruled entirely. A defendant whose economic or safety certificate has thus been revoked may then appeal to the courts, which consider the question as an appellate case. The courts are entitled to re-examine the findings of fact in these cases only when they find that there is no substantial evidence to back them up. Where substantial evidence exists, the courts are bound by the Board's findings of fact.

Executive Functions. The Board also has several functions which are exclusively executive in nature. In the field of economic air carrier activity, the Board has the duty to police the various carriers and to enforce the law against them in case of violation. The Board's staff is continually checking the reports filed to ascertain whether carriers are complying with the law and policies of the Board. In general, it maintains the same vigilance over this type of activity as do other law enforcement officers.

It is interesting to note that the Board does not have parallel enforcement powers over safety regulations. This activity is assigned by law to the Administrator of Civil Aeronautics, who is not on the Board's staff nor directly connected to it.

Another function of an executive nature which the Board possesses is advising other agencies of the government about loans to United States air carriers. It also works in an advisory capacity with the State Department in its negotiations for air transport and other air agreements with foreign governments.

Fig. 24 is an organization chart of the Civil Aeronautics Board. The duties of the various divisions are as follows:

Office of the General Counsel is headed by the Board's chief legal officer and is responsible for providing the Board with advice and assistance with respect to (1) legal phase of the economic and safety regulatory activities of the Board; (2) representation in court proceedings; (3) the preparation, review, and interpretation of its Economic Regulations, its Civil Air Regulations, and comment on pending legislation; (4) the activities of the Air Coordinating Committee and the International Civil Aviation Organization in the legal field; and (5) matters concerning or arising out of international agree-

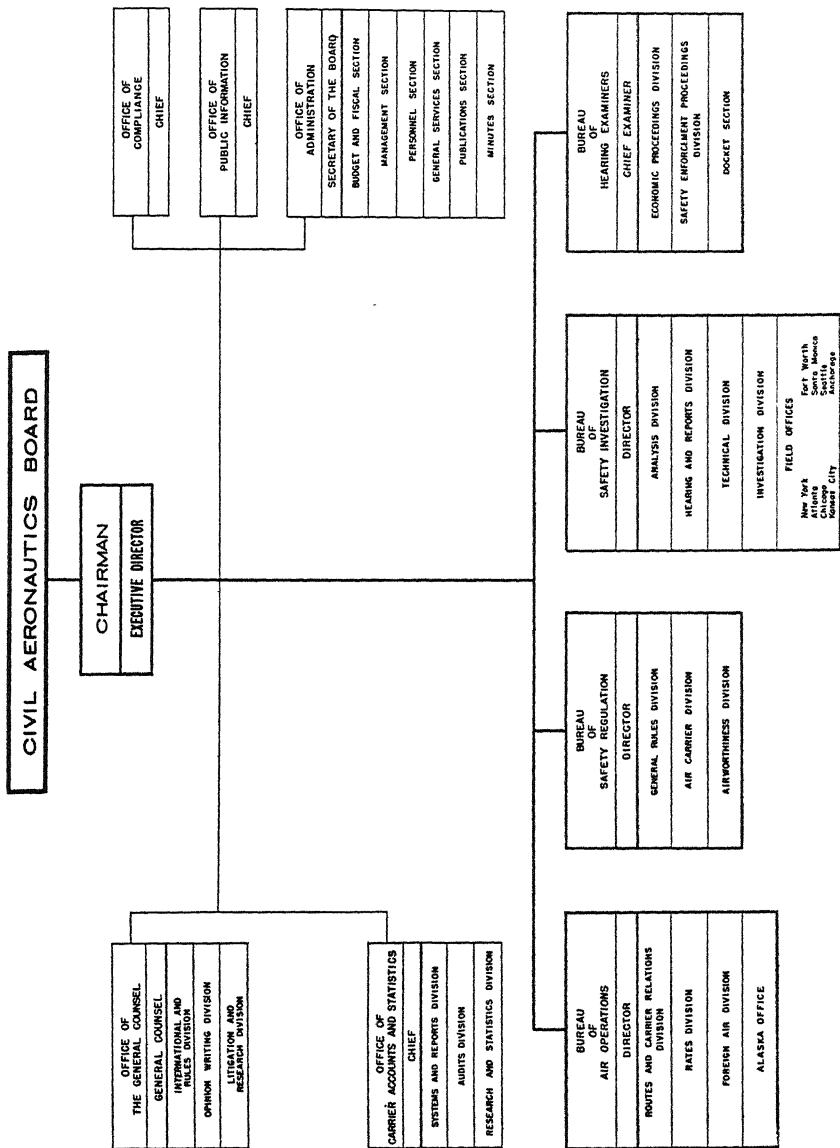


FIG. 24. Organization of the Civil Aeronautics Board.

ments relating to civil aviation and the work of the Board in the negotiation of aviation agreements.

Office of Compliance is directly responsible for the enforcement of the economic regulatory provisions of the Civil Aeronautics Act. The functions of this office include the continuing development and execution of economic enforcement plans, programs, and procedures; the investigation of violations; and the disposition of enforcement cases. A substantial amount of the work is devoted to informal activities for the prevention or correction of violations. All other cases are disposed of by formal enforcement action, which includes: (1) cases disposed of upon stipulations or other consent agreements, (2) formal administrative proceedings before the Board, and (3) court actions and proceedings.

Office of Public Information is the public relations division of the Board and has the responsibility of dealing with newspaper and other writers and the general public when information on Board action or on the general subject of commercial air transportation is sought.

Office of Administration is responsible for the co-ordination and execution of general administrative matters, including budget, personnel, management analysis, and administrative services, thus relieving the Board members of routine administrative matters. The bureau is also responsible for the recording and certification of Board actions; for the reproduction and distribution of Board orders, regulations, and other publications; and for the procurement of supplies, equipment, and space necessary for Board operations.

Office of Carrier Accounts and Statistics is concerned with those Board functions involving accounting and auditing; formulation of financial, statistical and operational analyses for use at rate and other hearings; and the furnishing of witnesses at such hearings to testify to matters of a financial and statistical nature. In the accounting and auditing field this office is concerned with the development of uniform systems of accounts and uniform systems of periodic financial, statistical, and accounting reports; development of cost standards and measures of economy and efficiency of airline operation to be used in rate activities, analysis, and auditing of reports submitted by the carriers; special investigations of an accounting and financial nature; and periodic audits of the books and accounts of United States certificated air carriers.

Bureau of Safety Regulation is responsible for developing and preparing all Civil Air Regulations and amendments providing the safety standards under which all United States registered aircraft,

their component parts, and accessories are manufactured, maintained, and operated; and those safety regulations respecting the operation of foreign aircraft within the United States. It is also the responsibility of this bureau to conduct continuing studies of technical developments in the aviation industry with respect to new types of aircraft, engines, propellers, appliances, products, processes, and operating procedures. The bureau also is concerned with the Board's responsibility in the field of international air safety and the co-ordination of standards adopted by the International Civil Aviation Organization with United States Civil Air Regulations.

All rules and amendments formulated by the Bureau of Safety Regulations are co-ordinated with the industry and other governmental agencies to assure the practicability of such rules. To this end, personnel of the bureau conduct conferences with these other parties and participate in technical conferences with them.

Bureau of Safety Investigation is responsible for the investigation of accidents involving civil aircraft of United States registry. The bureau determines the necessity for holding public hearings following accidents, conducts such hearings, and prepares reports setting forth the probable cause of the accident. On the basis of information thus obtained, the Bureau prepares studies and makes recommendations to prevent similar accidents. From the facts obtained during accident investigations and developed by bureau specialists who conduct laboratory and other technical tests, the bureau recommends that the Board promulgate new Civil Air Regulations or revise or amend existing regulations. The bureau may also recommend the cancellation of certain regulations which investigations have shown to be impractical due to the constant operational developments in the aviation industry and constantly changing flight technical equipment.

Bureau of Air Operations is concerned with Board functions affecting mail rates, air carrier tariffs, air route matters, service matters, air carrier relationships, economic compliance matters, and intergovernmental civil aviation activities.

The bureau's activity in air mail rates includes the initiation of mail rate proceedings, processing of mail rate petitions, and the preparation of final drafts of Board mail rate opinions.

Bureau activities connected with commercial air carrier tariffs cover both passenger and property rates and charges, the analysis of reasonableness and propriety of rate-fixing agreements between United States-flag carriers and foreign carriers, and the development of the United States position concerning such rates.

In route matters the bureau prepares analyses of the current and historic economics of air transport in both the domestic and international fields in connection with proposed new routes and handles the processing of applications for and issuing letters of registration to noncertificated carriers.

The bureau's work in service matters includes operating schedules, airport notices, nonstop notices, service suspensions, changes in service patterns, issuance of certificates upon a showing regarding the adequacy of airports, free and reduced rate transportation, official mileage certification, and the preparation of studies to determine the desirability of service pattern changes of United States international carriers.

In air carrier relationships, the receipt of and recommendations for approval or disapproval of agreements and interlocking relationships, the receipt and analysis of stock ownership reports, and the preparation of studies concerning the effects of proposed consolidations, mergers, and acquisitions of control are all part of the bureau's responsibility.

To assure economic compliance, the bureau also operates an informal program concerned with the obligations of air carriers with respect to the filing of intercarrier agreements and foreign government agreements, the investigation of complaints relating to rates, fares, and charges, and the disposition and settlements of such complaints. The bureau also engages in intergovernmental activities, including the negotiation of bilateral air transport agreements with foreign nations, preparation of background studies covering the domestic or international aviation policies of foreign governments, and the preparation of studies and making of recommendations as to the United States position with respect to problems on the agenda of the International Civil Aviation Organization. (See Chapter 10.)

Bureau of Hearing Examiners is responsible for the conduct and disposition of all formal proceedings arising under the economic regulation and safety enforcement provisions of the Civil Aeronautics Act. The examiners sit as trial judges, with full power to administer oaths, rule on motions, issue subpoenas, receive or exclude evidence, and in general perform the functions of a presiding officer, making recommendations to the Board for action on all formal motions or petitions filed in connection with formal proceedings.

The economic proceedings processed by this bureau include not only applications for new routes, new systems, extensions of systems,

amendments, mergers, acquisitions or consolidations, and the transfer of route certificates, but also those proceedings instituted by the Board as a result of an order on some carrier to show cause why some action should or should not be taken or proceedings for general investigation. The proceedings are received and officially recorded in the bureau's docket section, assigned a docket number, and processed in the order of filing, unless it is a matter which warrants priority or immediate action.

An examiner, after completion of all necessary procedural steps, which usually include a prehearing conference, a public hearing, and exchange of exhibits and briefs, prepares a report in which he analyzes the evidence, sets forth his conclusions with respect to the underlying factual issues involved, and presents his ultimate conclusions and the recommendations which he makes to the Board. Under the Board's procedure, this report is subject to exceptions by the parties, briefs in support thereof, and requests for oral argument before the Board. In some instances, however, the examiner's report is waived, and the record certified to the Board by the examiner immediately following the close of a hearing.

The safety enforcement proceedings handled by this bureau include a wide variety of violations which may be incurred through operation of aircraft. In addition, these proceedings include appeals from the denial or refusal of the Administrator of Civil Aeronautics to issue airmen certificates to applicants. Safety enforcement proceedings involving violations of the safety regulations are instituted by the filing of a complaint that a violation has occurred. The Board requires that an answer to such a complaint be filed within ten days and that the complaint be considered as admitted unless specifically denied. With the filing of the complaint and answer, the matter is turned over to one of the bureau's safety enforcement examiners.

In the so-called "nonhearing" case, the respondent waives his statutory right to hearing and expresses his willingness to stand upon his answer and the evidence submitted by the Administrator. When the record is complete with this evidence, the examiner issues a written initial decision which analyzes the evidence, comes to a conclusion with respect to whether the complaint has been substantiated, and imposes the penalties. Penalties range from a temporary suspension for a ten-day period to revocation of the permit.

In the so-called "hearing" case, either the respondent enters an appearance in his own behalf or he may be represented by counsel pre-

senting his case in answer to the case presented by the Administrator. With the consent of both parties, the examiner may make an oral finding at the close of the hearing; but if the parties are not willing to agree to this procedure, the examiner then prepares a written initial decision. In both hearing and nonhearing cases, appeals may be taken to the Board from the findings of the examiner; and if such appeals are not taken, the initial decision becomes final.

Organization and Functions of the Civil Aeronautics Administration

The Civil Aeronautics Administration is headed by an Administrator who, together with his two assistants and staff, performs the work his title suggests—that is, the administration of the technical side of aviation. He is responsible for the maintenance of the federal airways (including navigational aids); supervision of control tower operators and airways traffic controllers; and administration of the federal airport program, which provides for federal participation in the construction of airports. (See Chapter 2.) He is charged with issuing airmen certificates pursuant to the regulations of the Civil Aeronautics Board, as well as other types of safety certificates, and with maintaining a force of inspectors whose duty it is to see that the Board's safety requirements are observed. In the enforcement field, one of his functions is to present revocation cases as prosecutor before the Board's examiners. In respect to revoking safety certificates, his work thus parallels that of the Board's staff in prosecuting violations of the Economic Regulations. In both cases, however, the hearing is conducted by an examiner of the Board and the decision is rendered by the Board.

Fig. 25 is an organization chart of the Civil Aeronautics Administration. The duties of its various divisions are as follows:

Budget Office represents and provides special staff assistance to the office of the Administrator in the development, application, and execution of budgetary problems and policies required to assure financial support of the agency.

Organizations and Methods Office provides staff assistance to the office of the Administrator and to all other offices of the CAA (both in Washington and the field) in major organization and management matters. In this connection it develops plans to cope with new or anticipated requirements and makes surveys and recommendations for improvements in organization, administrative techniques, and management practices throughout the CAA.

Personnel Office develops, applies and executes personnel policies, recruits employees, classifies positions, and has charge of employee-training and employee-management relations.

Office of Aviation Defense Requirements collects, evaluates, establishes justification for, and presents to agencies of higher authority the consolidated civil aviation defense production requirements; co-ordinates all CAA defense production activities; provides basic poli-

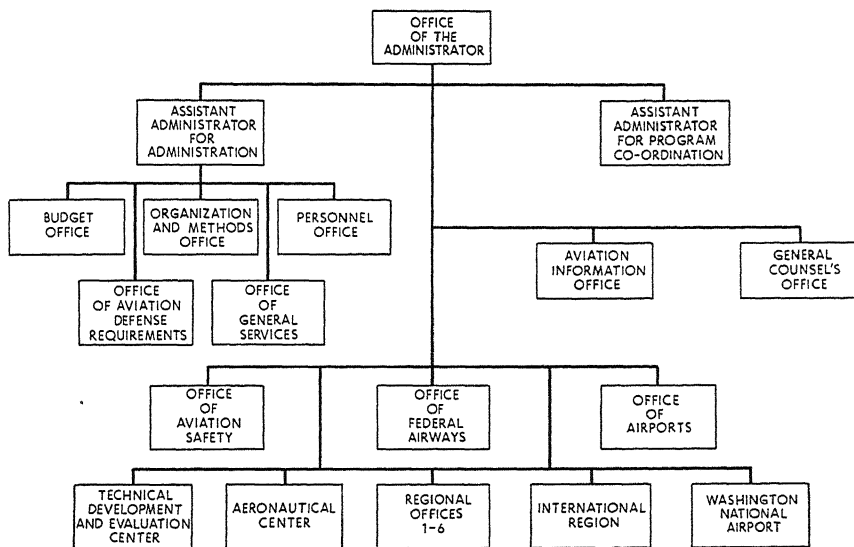


FIG. 25. Organization of the Civil Aeronautics Administration.

cies, standards, and procedures for CAA defense production activities; establishes periodic programs as a basis for satisfying the needs of civil aviation for materials and supplies according to availability; issues allotments and priorities for various civil aviation programs; and maintains basic records and such reports for the Administrator or for agencies of higher authority as may be required under the defense production program.

Office of General Services plans and co-ordinates the development and application of policies and procedures governing the procurement, management, and maintenance of properties and material required for CAA operations; supervises the procurement and maintenance of CAA aircraft; provides office space and services; audits CAA accounts of all types including sponsors' accounts under the federal-aid airport program; and establishes and maintains an adequate security program to provide proper safeguards for all classi-

fied documents, equipment, and other material while in the possession or custody of the Administrator.

Aviation Information Office directs and co-ordinates the dissemination of information on civil aviation to the public.

General Counsel's Office renders all legal services required by the CAA and by its officers serving in connection with other bodies, such as the Air Coordinating Committee and the International Civil Aviation Organization.

Office of Aviation Safety administers and enforces Civil Air Regulations dealing with the examination, certification, inspection, and improvement of: (a) the design, manufacture, and maintenance of aircraft and aircraft components; (b) the competency and physical fitness of airmen; and (c) flight operations and technical facilities of air carriers, other aircraft operators, airman schools, and other air agencies. This office also develops and recommends for approval of the Administrator and for promulgation by the Civil Aeronautics Board or Administration new or modified regulations. It operates a system for central registration and recording of encumbrances affecting the title to aircraft, engines, propellers, and appliances. It investigates accidents to the extent necessary for determining whether they involve the airworthiness of aircraft; the competency of airmen and/or operators, either directly or indirectly; a violation of Civil Air Regulations or any certificate issued by the CAA; or navigational facilities. It takes immediate remedial action to prevent recurrence, and analyzes accident data and service difficulty reports for purposes of planning corrective action. This office also collaborates with the Air Coordinating Committee and the International Civil Aviation Organization and other public, military, private, or foreign international agencies in the development of CAA and United States positions on matters involving technical regulation and improvement of aviation safety; and on the development, maintenance, and operation of improved aircraft and equipment for use in air commerce (see Chapter 11).

Office of Federal Airways plans and co-ordinates the establishment, maintenance, operation, and certification of aids to navigation and traffic control comprising the common system of the federal airways. (See Chapter 2.) In this connection it formulates programs and prescribes policies, standards, and procedures governing the installation, utilization, operation, and maintenance of facilities for the navigation of aircraft, the control and safety of air traffic, and the provision of an integrated flight-assistance and air-to-ground commu-

nications service. This office also plans, directs, co-ordinates, and establishes requirements and standards for the construction, improvement, maintenance, and operation of landing areas and airports as assigned by the Administrator in collaboration with the Office of Airports. It also collaborates with the military and other government and foreign agencies, and with private and nongovernment users of the airspace, in the adoption of domestic and international airways systems and services, the provision and utilization of necessary facilities, and the collection and dissemination of information on aids and hazards to navigation; and it participates in the work of the International Civil Aviation Organization, the Air Coordinating Committee, and other co-ordinating organizations. An important function of this office is collaboration with the Department of Defense in planning for military use of the common system of federal airways, for co-ordination of defense plans and operations, and for the military use of CAA facilities.

Office of Airports plans and co-ordinates CAA activities for fostering the establishment and development of a national system of airports. (See Chapter 2.) In this connection it prepares and annually revises the National Airport Plan; provides for the granting of federal funds to sponsors in conformity with approved programs and regulations; and furnishes airport advisory service on planning and construction problems of other airports. It also develops national standards for airport location, design, construction, and operation; and supervises the necessary rehabilitation or repair of public airports damaged by federal agencies, for which funds have been appropriated.

Technical Development Evaluation Center, located at Indianapolis, Indiana, conducts research and performs service testing and evaluation directed toward eliminating hazards in and improving the safety and efficiency of the operation of aircraft, systems of aids to air navigation, air traffic control, and landing facilities.

Aeronautical Center, located at Oklahoma City, Oklahoma, plans and conducts such standardization and training courses for CAA employees and other individuals as are required to establish or maintain personnel proficiency for the various programs of the CAA. It also conducts research and development projects in aviation medicine and modifies, assembles, and distributes equipment and materials for installation or erection of CAA facilities or aids to air navigation.

International Region, with headquarters at Washington, D.C., executes programs for certification and inspection of United States air

carriers engaged in international and overseas operations, and foreign carriers operating to and within United States territory. It also fosters the adoption and utilization of United States type aeronautical equipment, standards, and procedures by foreign countries; evaluates and assists in the solution of operational problems and requirements of United States-flag carriers; and plans and administers civil aviation activities under United States programs of economic and technical assistance to foreign nations, including the provision of technical advisory services to civil aviation and to our diplomatic, economic, and military missions abroad.

Washington National Airport is the only airport in the United States operated by the federal government. This office of the CAA operates and maintains this airport and negotiates with air carriers and others for the use of its facilities.²¹

Regional Offices, six in number,²² carry on the following activities within each of their geographical areas: (a) Establish, maintain, and modify landing areas, facility structures, communication systems, electronic devices, air traffic control systems, and other aids to air navigation which comprise the federal airways system. (b) Conduct activities relating to participation by public sponsors in the Federal-Aid Airport Program and the granting of funds for such purposes. (c) Advise civic and other public agencies and private enterprises on airport site selection, planning, design, development, maintenance, and approach protection. (d) Operate air traffic control and communications stations involved in the facilitation and control of air traffic. (e) Conduct all aviation safety activities relating to airmen, aircraft, air agencies, fixed base operators (aircraft service operators), and air carriers. (f) Conduct accident and regulation violation investigations. (g) Foster and promote the development of civil aviation.

The Air Coordinating Committee

As aviation problems increased in scope, there was a need for more co-ordination between the various agencies in this country, but particularly between the United States and the central world agency—

²¹ In 1954, there was a movement, originating in the Department of Commerce, to incorporate Washington National Airport as a self-sustaining enterprise and thus remove it from the jurisdiction of the Civil Aeronautics Administration. This move was part of the trend to "get the government out of business" but also was held to have certain managerial and budgetary advantages. The legislation to bring this about failed to be passed by Congress.

²² Region 1, Jamaica, L.I.

Region 2, Fort Worth, Texas

Region 3, Kansas City, Mo.

Region 4, Los Angeles, Cal.

Region 5, Anchorage, Alaska

Region 6, Honolulu, T.H.

International Civil Aviation Organization (ICAO)—after its establishment in 1947.²³ This co-ordination was brought about first informally and then through the creation of the Air Coordinating Committee by Executive Order of the President in 1946.²⁴ This Executive Order directed that the committee should “consult with the representatives of the United States to the then Provisional International Civil Aviation Organization, or to the permanent successor thereof, and recommend to the Department of State general policy directives and instructions for the guidance of said representatives.” Another phase of the committee’s activities is concerned with the consideration of industry views by the government when specific problems are under review. The Air Coordinating Committee is made up of voting members from the State Department, Army, Navy, Air Force (Department of Defense), the Department of Commerce, the Treasury Department, the Post Office Department, and the Civil Aeronautics Board. The Budget Bureau and the office of Defense Mobilization participate as non-voting members. Other departments and agencies are occasionally invited to participate, with the right to vote, on aviation matters which are of substantial interest to them.

The Air Coordinating Committee operates on the principle of unanimous vote. As a co-ordinating committee, it is essential that the positions which it recommends be in accord with the policies of all the member agencies. Although extended discussion is sometimes necessary in order to obtain a unanimous opinion, there have to date been no instances where it has been necessary to have recourse to the provision contained in Executive Order 9781, creating the committee, which provides for submission to the President of “those important aviation questions the disposition of which is prevented by the inability of the agencies concerned to agree.” Action is taken on recommendations made to the committee by the agency or agencies which have the direct responsibility in the field through the authority of the Air Coordinating Committee member for that agency. The committee itself, as a co-ordinating group, has no authority to direct action by any of its member agencies.

In addition to providing co-ordination on routine matters of aviation policy between the responsible governmental departments or agencies, the committee is also directed by Executive Order to submit to the President “such of the Committee’s recommendations on avia-

²³ See Chapter 10. From 1945–47 it was known as the Provisional International Civil Aviation Organization (PICAO).

²⁴ See Charles O. Cary, “Air Coordinating Committee,” *Air Affairs*, Autumn, 1949.

tion policies as require the attention of the President by reason of their character or importance." The committee examines only those aviation problems and developments which affect more than one participating agency.

In 1954, President Dwight D. Eisenhower requested the committee to conduct a comprehensive review of federal aviation policies, concentrating particularly on those affecting civil aviation. Their report was accepted by the President "as a guide in the future consideration of questions related to the subject of civil aviation and in making appropriate recommendations to Congress."²⁵

*Role of the States and Municipalities in Regulation*²⁶

The federal government has, since 1926, virtually pre-empted the field of regulating aviation safety; but, in the realm of economic regulation, a different situation prevails, since Title IV of the Civil Aeronautics Act of 1938 (dealing with air carrier economic regulations) covers interstate carriers only. States may, therefore, empower a state authority to promulgate regulations; and even if the actual law remains uniform with other states, there is no way whereby the regulations can be kept so. Moreover, as the industry has become more of a paying proposition in all its branches, particularly in local operations, the creation of state regulatory bodies, often largely honorary in character, is an invitation to such bodies to assume powers, particularly in the field of economic regulation, which may not be in the best interests of the whole scheme of air transportation. Air transportation, like all other public service industries, must operate within the framework of public policy; and whether it attains or fails to attain its full capacity for public service is in large part dependent upon the soundness or unsoundness of that policy. We must not forget that aviation's ability to overcome the physical barriers of land and water gives no assurance of a similar ability to surmount political

²⁵ The President's Air Coordinating Committee, *Civil Air Policy* (Washington, D.C.), 1954. Recommendations in this report will be discussed in the appropriate chapters of this volume.

²⁶ See Oswald Ryan, "Economic Regulation of Air Commerce by the States," *Virginia Law Review*, March, 1945; P. L. Waterman, *The Role of the States in Postwar Aviation* (University of California, Berkeley: Bureau of Public Administration, 1945); John H. Frederick, "State Legislation Needs for Airports," *Southern Flight*, September, 1944; Charles S. Rhyne, *Airports and the Courts* (Washington, D.C.: National Institute of Municipal Law Officers, 1944); Charles S. Rhyne, "Airport Legislation and Court Decisions," *Journal of Air Law and Commerce*, Summer, 1947; Herzel H. E. Plaine, "State Aviation Legislation," *Journal of Air Law and Commerce*, Summer, 1947; Cooper, *op. cit.*; Madeline C. Dinu, "State Aviation Officials—Some of Their Duties, Responsibilities and Activities," *Journal of Air Law and Commerce*, Summer, 1947.

and economic barriers that may be unwisely or unwittingly erected against its progress.

State participation in safety regulation has largely been coincident with and concerned with the same aspects of air transportation as federal regulation, but in the field of economic regulation an important issue has been raised which is believed to have grave implications for the future of air transportation in this country. This issue is whether air transportation in the future is to develop under the regulatory control of the national government, as in the past, or whether it is to be subjected to the multiple, and possibly conflicting, control of 48 regulatory bodies in addition to the federal agency. No sound answer to this problem can be reached without taking account of the inherently interstate and national character of air transportation.

In view of the need for uniformity in aeronautical regulations, the Air Coordinating Committee in its report on civil air policy²⁷ made the following statement:

The legislative action by the Congress, together with the implementing regulations of the responsible agencies of the Federal Government, have regulated air safety to such an extent as to constitute preemption of the field. Therefore, under the present statutory and regulatory structure, neither the states nor their political subdivisions may constitutionally promulgate air safety regulations.

The need for state assistance in the enforcement of violations involving the operation of small private aircraft was recognized in 1951 by a working agreement made between the federal agencies and the National Association of State Aviation Officials. Under this agreement, it was expected that the states would enforce the Federal Air Safety Regulations in such cases by using their own personnel and applying their own local laws. In this connection the Air Coordinating Committee stated:

The Federal Government continues to encourage state safety enforcement action in the area of violations arising out of the actual piloting or navigation of small private aircraft where quick local action is most effective. Such enforcement action should be based on local statutes prohibiting the careless and reckless operation of such aircraft, and directing the courts to consider the Federal Regulations in determining what is careless and reckless operation. State assistance in Federal prosecution of violations is also encouraged.

The nature of the air transportation business is such that the trunk-line carriers perform the greater part of their services in interstate, rather than intrastate, commerce. Air transportation is long-distance

²⁷ *Supra*.

transportation. The fact that the main airline selling point is speed and that, to make speed count, service must generally be performed over substantial distances inevitably means a preponderance of interstate business. Thus, from its beginning, this form of air transportation has been more definitely a matter of federal concern than any other form of transportation. Only since the close of World War II has there been any development of intrastate air transportation, which first started in Texas in 1946 and later in California. By the middle of 1949 the California operators, particularly between Los Angeles and San Francisco, had become a serious problem from the standpoint of competition with the interstate operators certificated by the Civil Aeronautics Board to operate over the same routes. It is still an open question whether the economics of this method of transport will permit the survival of purely local operations that do not involve the carriage of passengers and property moving in interstate commerce.

Perhaps the primary threat of state economic regulation lies in its potential effect upon the national policy of regulated competition, which is discussed in Chapters 6 and 7. If each of the 48 states should exercise the right to grant certificates of public convenience and necessity to local intrastate airlines, many of which would be operating in competition with the intrastate segments of our interstate airlines, the result would probably be the economic impairment of our air transport system and an obstruction to its future growth. The interstate and intrastate activities of an airline are so intermingled that uniformity of regulatory action is an absolute essential to a sound and orderly economic development, and such uniformity is not practicable under a system of multiple control. Public regulation under such circumstances could become a crazy quilt of overlapping jurisdictions and inconsistent patterns which would destroy whatever regulated competitive balance has been built up under the federal policy to date.

It is only in the case of the airline whose operations neither parallel and compete with the interstate carrier, nor connect with the interstate carrier in such a way as to carry interstate commerce, that the state authority could regulate through the issuance or denial of certificates without the danger of seriously disrupting the national aviation program. It may be questioned whether many such local operations will exist. Many will doubtless be started from time to time; but, except under most unusual circumstances, few will survive in such a restricted area, since the economics of the market for air trans-

port services will normally require the local operator to adjust his operations to a market which extends beyond the border of a single state.

Another illustration of the probable effect of imposing state economic regulation upon our scheduled airlines that carry intrastate, as well as interstate, commerce may be seen when we apply state control to the intrastate rates of our interstate airlines. Air carriers that operate across state lines, especially where their operations cross ten or twenty states, as some now do, are not likely to be effectively regulated by the action of the many states through which they pass. The various state regulatory bodies in such a case are not likely ever to be in possession of all the facts with respect to the costs of a far-flung airline. Only an agency with jurisdiction over the entire operations of such a carrier would be in a position to determine effectively the reasonableness of the over-all costs and the propriety of the cost allocations among the different classes of traffic. State regulation under such circumstances presents such complex problems that it is to be hoped that, if the states do exert jurisdiction over the economic activities of air carriers, they will at least exempt the interstate airlines from such multiple state control.²⁸

Finally, there is the financial burden which compliance with multiple regulation would place upon the airlines. In the years immediately ahead, it will be necessary for air transportation to drive steadily and successfully toward lower cost levels if the industry is to serve a mass transportation market and attain economic stability and security. In this respect, air transportation differs significantly from surface transportation, both rail and highway. There are differences in the volume of operations, differences in the operating margins, a difference in the proportion which local business bears to interstate business, and differences in the number of separate jurisdictions to

²⁸ In *Western Air Lines v. Public Utilities Commission of California*, 342 U.S. 908 (1954), the Supreme Court of the United States rendered ineffective an attack by a scheduled airline on state regulation of interstate air carriers. On March 1, 1951, Western Air Lines had increased its air coach fares between Los Angeles and San Francisco with the approval of the Civil Aeronautics Board. On March 6, 1951, the Public Utilities Commission of California ordered an investigation into Western's fares in California. On April 24, 1951, the Public Utilities Commission of California issued an order effective May 7, 1951, purportedly authorizing the air carrier to increase its air coach fares to the level in the tariff previously approved by the CAB, but requiring Western to refund the excessive fares collected in the interim. Western petitioned the California Supreme Court to review the order of the California Public Utilities Commission. This petition was denied without opinion and Western sought relief in the United States Supreme Court. This Court dismissed the appeal for want of a substantial federal question, with Mr. Justice Black and Mr. Justice Burton being of the opinion that probable jurisdiction should be noted.

which air carriers would be subject; all these combine to disprove any assumed analogy between air transportation and surface transportation as a support for the multiple regulation of air commerce.

In connection with the multiple economic regulation of air commerce the Air Coordinating Committee stated:

Intrastate transportation of persons and property by air wholly within the boundaries of a single state and not part of nor connected with the flow of interstate or foreign commerce is properly subject to the economic regulatory control of the state involved: provided that, where such intrastate transportation is performed by an air carrier as defined in the Civil Aeronautics Act, the rates, fares, charges and practices for such transportation should be subject to the exclusive control of the Federal Government.

*Exercise of Control over Airspace*²⁹

The ever-expanding extent in the United States of aeronautical activity, both civil and military, has brought into sharp focus the need for a greater understanding of the rights, duties, authority, and interests in airspace. The problem is twofold. On the one hand it involves a question of federal-state relations under the Constitution with respect to the power and duty to control the airspace. On the other hand it involves the relationship between the users of the airspace for purposes of flight and the owners of surface interests below.

The United States as a nation has a strong national interest in the airspace for at least three reasons: (a) it is a highway for interstate commerce; (b) it is a zone vital to the defense of the country; and (c) it is necessary to the postal service. Congress, as early as 1926, affirmed this paramount national interest and the definition of its nature and scope by adopting the Air Commerce Act of 1926, which has been previously discussed.³⁰ Furthermore, the legislative history of the Air Commerce Act of 1926 shows that in enacting it Congress relied on the commerce power, the war powers, and the postal power in combination.

The Air Commerce Act of 1926 and the Civil Aeronautics Act of 1938 have thus formally recognized and asserted federal jurisdiction in the airspace for all purposes necessary to control, preserve, and protect air navigation in the broadest sense. Notwithstanding this plenary power for these specified purposes in the airspace above the

²⁹ This section is adapted from The President's Air Coordinating Committee, *Civil Air Policy*, *Supra*, pp. 46-48. See also John C. Cooper, "State Sovereignty vs. Federal Sovereignty of Navigable Airspace," *Journal of Air Law and Commerce*, Winter, 1948.

³⁰ That act, as amended by the Civil Aeronautics Act of 1938, provides that "the United States of America is hereby declared to possess and exercise complete and exclusive national sovereignty in the airspace above the United States . . ." (49 U.S.C. 176).

several states, existing jurisdiction in the local governments for other purposes has not been affected. The Air Coordinating Committee therefore concluded:

The Federal Government should continue, as it now does, to exercise exclusive control of the airspace over the United States, its territories and possessions, for the purposes of controlling, preserving, and protecting air navigation in the broadest sense. Beyond that, existing jurisdiction of the states and their political subdivisions for other purposes in the airspace above their territories should continue.

The power of the federal government under the commerce clause of the United States Constitution extends not only to the instrumentalities of interstate commerce but to the medium through which they operate. Thus, the jurisdiction of the federal government extends to all airspace navigable in fact in which aircraft operate while engaged in or directly affecting interstate commerce. In the enactment of the Civil Aeronautics Act of 1938, the Congress expressly exercised its regulatory power in the airspace navigable in fact. Thus, the Civil Aeronautics Board was directed to adopt rules for safe altitudes of flight, and for prevention of collisions between aircraft or between aircraft and land or water vehicles.

However, because the term "navigable airspace" in the Civil Aeronautics Act is defined as the airspace above the minimum altitudes of flight prescribed by regulations issued by the Board under the Act, and because of certain language used by the Board in these regulations, some confusion has arisen on this point. There is some doubt whether the existing federal regulations are phrased to make this provision operative throughout the take-off and landing operations of aircraft. While this doubt is hardly justified, resolution of the matter seems desirable, and the Air Coordinating Committee has recommended that:

Existing Federal regulations relating to minimum altitudes of flight should be re-examined by the appropriate agencies to determine whether revision of such regulations is necessary or desirable in order to dispel any possible inference that the Federal Government has not exercised its regulatory jurisdiction over the entire flight of an aircraft in the airspace above the United States navigable in fact.

Instances may arise where flights over private land are so low, so frequent, and so injurious to the surface, that, if performed by the federal government, they would amount to taking private property, against which protection is afforded under the Constitution. Such instances have been rare. Whether flights by private operators through

the navigable airspace, as expressed by Congress in the Civil Aeronautics Act and otherwise in conformity with federal regulations, may create a valid claim in the landowner is a question the courts may still have to decide, since the airspace is a highway protected by the commerce clause of the Constitution.

It is recognized that low flight may create a problem of noise and disturbance. This is primarily a social problem, to which the application of doctrines of real property law cannot afford an appropriate solution. The erection of a barrier to flight, unconnected with the safety of air operations, may aggravate the problem by causing the air traffic to engage in additional maneuvers. For this reason local ordinances and legislative enactments, which are intended to protect communities against the noise and disturbance, are not valid or proper cures. The true solution lies in improved procedures around airports, taking into account all aspects of the problem and the continuing technological improvement in aircraft performance. The Air Coordinating Committee recommendation was that:

The Federal Government should continue to use its best efforts to devise means, methods, and improved procedures and techniques to minimize noise and disturbance caused by aircraft landing and taking off. Industry should be encouraged to do likewise. Additionally, the Federal Government should continue to watch closely any litigation which may arise in this area and where necessary participate therein to the end that the courts may be fully advised on the governmental nature of this problem.

Airspace in the vicinity of airports and airways must be protected against the erection of structures which would interfere with air navigation. The Congress has primary authority to prevent interference with air navigation, analogous in part to the authority it possesses to prevent obstructions in the navigable waters. An example of the exercise of this power is contained in the Communications Act of 1934, as amended, which includes the power of federal control over the erection of radio transmitter towers within the navigable airspace which interfere with its public use. However, the provision of this Act are not adequate to cope with all hazards to air navigation, so that the Air Coordinating Committee suggested that:

The power of the Federal Government to control the erection of structures within airspace for the purpose of controlling and protecting air navigation should be further strengthened by legislation.

Chapter

5 * ECONOMICS OF COMMERCIAL AIR TRANSPORTATION

FIRMS in the commercial air transport industry have certain characteristics which influence economic adjustments in the industry. These are discussed in detail in later chapters, but may be briefly summarized here as follows:

1. The industry is considered to be "affected with the public interest," just as are other carriers and public utilities. It is therefore subject to government regulation. For the same reason, considerable government financial support has been provided for certain types of airlines, a policy that will probably continue for some time.

2. Airlines are not "natural monopolies" in the usual sense of the term, and substantial competition could develop in the industry were it not for federal regulatory policies preventing it.

3. Fixed charges are lower, for a given volume of business, than in many other forms of transportation, because of the relatively small capital investment. Thus successful airline management is more dependent on efficient control of nonfixed expenses.

4. Technological progress has been relatively rapid in the air transportation industry and has in some cases made equipment obsolete long before it has become physically worn out.

The "Public Interest" Characteristics of Air Carriers

Important questions can be raised about the attitude of governments toward the airlines. Are the companies regarded as strictly "private" business, free of government control, and operated solely in the interests of the management and the investors? Or are they regarded as public utilities analogous to electric power and telephone companies? Likewise, to what extent are the airlines regarded as in-

struments of national policy—economic, diplomatic, and military?

In general, commercial air transportation has some characteristics of a public utility. These are defined in the Civil Aeronautics Act of 1938 (see Chapter 4), under which the Civil Aeronautics Board may regulate, as well as promote, the industry. Regulatory policies are discussed in subsequent chapters. The promotional policies of the Board have been of such significance as to affect materially the economic adjustments in the industry. Even before the passage of the Civil Aeronautics Act, the influence of government aid through the medium of air mail pay was of such importance that relatively little attention was given to cost in rate making. This is not unusual in a new industry when, during early experimental stages, the price of the good may bear little relationship to the total cost of producing it. For example, in 1948 the United States domestic airlines showed costs per available ton-mile (which means cost on a 100 per cent use factor) of approximately 30.5 cents, while for the same airlines the cost per actual revenue ton-mile was 58.4 cents. The United States trans-Atlantic airlines in 1948 and 1949 showed costs per available ton-mile of 57 cents, while the cost per revenue ton-mile actually carried was 95 cents. Contrast this with the 1947 figures for railroad freight in the United States of 7.86 mills per ton-mile, the ton-mile costs of the Inland Waterways Corporation in 1946 of 5.2 mills, and motor truck costs of 4.5 cents per ton-mile in 1947. For ocean steamships, based on the experience of American Export Lines, the average cost on an available dead weight ton-mile basis is less than 2 mills, while the cost per actual dead weight ton-mile carried is slightly over 4.5 mills.¹

Under the Act of 1938, competition was to be permitted to the extent necessary to assure the sound development of an air transport system properly adapted to needs of commerce, the postal service, and national defense. Routes were to be granted by the Board only on a showing of public convenience and necessity, and by implication the Board was not to grant them when unnecessary competition would result. It was the intent of the act that the companies be allowed to earn a "fair" return on their investment, to the extent permitted by cost and demand conditions.

These features—regulation of rates and service, control of the entry of new firms, limitation of profit to a "fair return" figure, and the

¹ See an address by John E. Slater, "American Passenger Ships in Overseas Transportation," before the Propeller Club, Port of New York, March 30, 1950.

obligation to perform particular services whether profitable or not—are characteristic of regulations applied to public utilities.

The Act of 1938 also showed the Congressional intent to make the airlines instruments of national policy—economic, diplomatic, and military. They were to be “adapted to the present and future needs of the foreign and domestic commerce of the United States, of the Postal Service, and of the national defense.” These are national objectives designed for the interests of the common welfare.

In respect to the question of “fair return,” the government policies extend farther in the direction of attempting to insure such a return than is the case with other regulated industries. Rapid communication by the carriage of passengers and mail requires that the airlines serve many points which may offer insufficient business to make operations to them profitable. For example, it has been estimated that it costs approximately \$60,000 a year, or about \$166 a day, to serve each of the smaller cities and towns on an airline’s system.² In order to make such operation possible, the Civil Aeronautics Act contains the requirement that the Board allow mail pay and/or subsidy payment to an honestly and efficiently managed airline sufficient, in conjunction with its other revenues, to permit it to cover costs of operation and, in addition, to earn a fair return on its investment. The airline, in turn, must maintain and continue the development of its system to the extent necessary to furnish satisfactory service, to set reasonable non-discriminatory rates, to perform the required postal service, and to maintain preparedness of assistance in national defense.

Thus, in summary, the airlines, although financed by private capital and managed by private enterprises, are subject to regulation as public utilities, provided government financial assistance, and regarded as government instrumentalities in the interest of national welfare.

Airline Revenues

Table 23 shows the revenues of the scheduled airlines from various sources during the period 1946 through 1953. During this period passenger revenue has accounted for a greater portion of the total than all other revenues combined, amounting in 1954 to 88 per cent

² See statement of Harold A. Jones, then member of the Civil Aeronautics Board, before the Air Transport Institute of the American University, Washington, D.C., February 2, 1949. In 1954, there were over 200 airline stations in the United States generating an average of less than 6 passengers a day. See Senate Doc. 163, 83d Congress 2d Session, p. 51.

TABLE 23

UNITED STATES SCHEDULED AIRLINE OPERATING REVENUES, 1946-53

Year	Passenger Revenues	% of Total	U. S. Mail ¹	% of Total	Express & Freight	% of Total	Other Revenues ²	% of Total	Total Operating Revenues
Domestic Trunk Airlines									
1946	\$ 272,573,481	87.39	\$ 20,273,557	6.50	\$13,269,914	4.26	\$ 5,776,089	1.85	\$ 311,893,041
1947	303,193,780	86.01	23,325,630	6.62	18,888,246	5.36	7,082,712	2.01	352,490,368
1948	334,735,598	80.98	47,837,531	11.57	23,788,568	5.76	6,991,190	1.69	413,352,887
1949	378,113,445	82.24	45,031,010	9.79	27,280,566	5.93	9,357,523	2.04	459,782,544
1950	430,098,393	82.06	46,311,377	8.84	34,266,653	6.54	13,432,189	2.56	524,108,612
1951	570,288,026	86.60	37,039,813	5.62	35,735,795	5.43	15,457,210	2.35	658,520,844
1952	671,257,035	87.40	35,910,283	4.68	41,382,189	5.39	19,465,085	2.54	768,014,593
1953 ³	782,185,122	88.36	35,867,547	4.05	46,236,326	5.22	20,967,290	2.37	885,256,285
Local Service Airlines									
1946	\$ 314,638	16.30	\$ 1,558,614	80.71	\$ 13,008	0.67	\$ 44,797	2.32	\$ 1,931,057
1947	2,280,124	26.99	5,957,097	70.51	60,179	0.71	150,931	1.79	8,448,331
1948	4,666,549	28.64	11,282,490	69.25	147,959	0.91	195,511	1.20	16,292,509
1949	7,362,007	33.55	14,054,998	64.06	252,159	1.15	271,465	1.24	21,940,629
1950	10,302,859	36.17	17,191,453	60.36	442,046	1.55	514,543	1.92	28,480,901
1951	16,259,176	43.21	19,739,169	52.45	666,230	1.77	967,572	2.57	37,632,147
1952	19,766,694	46.47	21,334,962	50.16	822,483	1.93	613,004	1.44	42,537,143
1953 ³	23,291,352	47.54	23,996,730	48.98	922,248	1.89	779,774	1.59	48,990,104
Insular Territorial Airlines									
1946	\$ 2,705,593	80.03	\$ 121,589	3.60	\$ 337,372	9.97	\$ 216,358	6.40	\$ 3,380,912
1947	3,102,050	79.52	162,019	4.15	429,523	11.01	207,286	5.32	3,900,878
1948	3,887,583	83.61	189,322	4.07	435,868	9.37	137,215	2.95	4,649,988
1949	3,454,961	80.15	246,985	5.73	454,161	10.54	154,566	3.58	4,310,673
1950	4,104,754	78.74	285,261	5.47	413,458	7.93	409,591	7.86	5,213,064
1951	4,639,164	74.69	642,705	10.35	512,083	8.24	417,563	6.72	6,211,515
1952	4,433,393	70.97	767,709	12.29	626,265	10.03	419,330	6.71	6,246,697
1953 ³	4,771,605	70.94	1,128,765	16.78	692,650	10.30	133,329	1.98	6,726,349
International									
1946	\$ 91,416,767	62.29	\$ 25,060,600	17.08	\$11,413,268	7.78	\$18,863,467	12.85	\$ 146,754,102
1947	140,652,113	67.29	32,299,890	15.45	17,526,276	8.39	18,531,252	8.87	209,009,531
1948	151,337,705	60.72	57,331,556	23.00	20,808,679	8.35	19,756,259	7.93	249,234,199
1949	158,479,705	57.81	75,197,073	27.43	22,126,828	8.07	18,350,932	6.69	274,154,538
1950	160,672,885	61.77	55,689,069	21.41	21,663,922	8.33	22,105,535	8.49	260,131,411
1951	184,691,825	64.14	53,213,231	18.48	25,244,764	8.77	24,785,841	8.61	287,935,661
1952	212,458,800	67.46	51,532,972	16.36	26,818,031	8.51	24,109,099	7.67	314,918,902
1953 ³	234,430,980	69.45	52,958,015	15.69	27,106,808	8.03	23,079,564	6.83	337,575,367
Total Industry									
1946	\$ 367,010,479	79.10	\$ 47,014,360	10.14	\$25,033,562	5.40	\$24,900,711	5.36	\$ 463,959,112
1947	449,228,067	78.28	61,744,636	10.76	36,904,224	6.43	25,972,181	4.53	573,849,108
1948	494,627,435	72.36	116,640,899	17.06	45,181,074	6.61	27,080,175	3.97	683,529,583
1949	547,410,118	72.01	134,530,066	17.70	50,113,714	6.59	28,134,486	3.70	760,188,384
1950	605,178,891	73.99	119,477,160	14.61	56,786,079	6.94	36,491,858	4.46	817,933,988
1951	775,878,191	78.35	110,634,918	11.17	62,158,872	6.28	41,628,186	4.20	990,300,167
1952	907,915,922	80.22	109,545,926	9.68	69,648,968	6.15	44,606,519	3.95	1,131,717,335
1953 ³	1,044,679,059	81.71	113,951,057	8.91	74,958,032	5.86	44,959,957	3.52	1,278,548,105

¹ Unadjusted data as reported by Air Carrier on C.A.B. Form 41.² Includes excess baggage, chartered transport services, other transportation and incidental revenues and foreign mail.³ Estimated.Source: Air Transport Association, *Air Transport Facts and Figures, 1954*

of the total. Mail revenue has been declining in relative importance, and revenue from express and freight increasing.

Airline Expenses

Table 24 shows the expenses of the airlines. *Flying operations* include the direct costs of plane operations, chiefly for wages and fuel. *Depreciation of flight equipment* is an important item of expense, because the rapid rate of obsolescence of aircraft due to technological developments causes the companies to depreciate such equipment over a very short period. Most airlines depreciate their newer aircraft over a period of seven years. (See Chapter 12.)

Flight equipment maintenance covers the costs of periodic inspection, service, and overhaul occurring after definite periods of flying time have elapsed. Standards of equipment maintenance are extremely high. To illustrate, the cost of maintenance and overhaul to an airline can be appreciated from the consideration of what is involved in overhauls.

A major 1,100-hour engine overhaul involves complete disassembly, after which all parts are thoroughly cleaned of dirt, grease, and carbon and the cylinders sandblasted. All parts then are inspected for cracks and other defects, some of them through a microscope, and checked for clearance. To detect cracks in the metal, all steel parts are inspected by a method whereby the part being inspected is magnetized with a special machine and dipped in a coal oil solution containing millions of small metal filings. If there is an internal defect, the filings adhere to the part directly over the crack. As defective parts are found, they are discarded and replaced, and the engine reassembled.

The overhauled engine, which is now practically new except for its case, is then "run-in" on a test stand at steadily increasing speeds. If its performance is satisfactory, it is remounted on an airplane and put through a flight test. At the time of a major engine overhaul the propellers also are completely disassembled, all parts inspected, and necessary replacements made.

In addition to this major overhaul every 1,100 flight hours, every engine receives a routine check whenever an aircraft lays over at a station for more than 24 hours. Every 50 hours, a routine inspection is made, and spark plugs and oil are changed, while at 100-hour intervals a more complete inspection is made, including a check of compression.

The 4,500-hour aircraft overhaul involves complete disassembly

TABLE 24
UNITED STATES SCHEDULED AIRLINE OPERATING EXPENSES, 1946-53

Year	Flying Operations	Percent Of Total Expenses	Direct Maintenance Flight Equipment	Percent Of Total Expenses	Depreciation Flight Equipment	Percent Of Total Expenses
Domestic Trunk Airlines						
1946	\$69,729,554	21.99	\$32,490,116	10.25	\$25,191,856	7.94
1947	85,032,761	23.01	41,029,360	10.99	36,240,510	9.71
1948	104,163,765	25.33	46,093,128	11.21	39,533,925	9.61
1949	119,961,143	27.57	50,270,468	11.55	39,447,911	9.07
1950	132,060,283	28.61	53,747,249	11.65	39,429,855	8.54
1951	160,469,094	29.04	66,571,477	12.05	41,272,647	7.47
1952	193,387,711	28.74	86,453,993	12.85	57,737,100	8.58
1953 ¹	237,235,516	29.75	97,427,515	12.22	78,675,733	9.86
Local Service Airlines						
1946	\$ 497,438	24.14	\$ 347,727	16.88	\$ 151,010	7.33
1947	2,203,155	24.29	1,336,677	14.74	922,395	10.17
1948	4,526,827	28.43	2,338,788	14.69	1,455,756	9.14
1949	6,486,968	28.98	3,280,965	14.66	2,042,843	9.13
1950	8,534,906	30.68	3,550,063	12.76	1,614,906	5.80
1951	10,944,529	30.43	4,284,377	11.92	1,611,775	4.48
1952	13,394,275	30.79	5,451,079	12.53	2,098,019	4.83
1953 ¹	15,724,570	30.86	6,486,230	12.73	2,443,040	4.79
International Airlines						
1946	\$32,447,634	23.21	\$11,063,761	7.91	\$ 8,953,732	6.40
1947	53,188,663	25.41	21,997,077	10.51	18,579,977	8.88
1948	67,163,026	28.55	24,241,052	10.30	19,588,511	8.32
1949	72,346,828	28.61	26,310,942	10.41	23,675,868	9.36
1950	70,979,947	28.58	26,158,179	10.53	25,637,532	10.33
1951	75,101,868	27.83	29,855,964	11.06	24,263,356	8.99
1952	87,364,714	28.71	33,041,404	10.86	26,479,341	8.71
1953 ¹	93,271,843	29.74	32,810,959	10.46	24,878,026	7.93
¹ Estimated						

Year	Aircraft Operating Expenses	Percent Of Total Expenses	Ground and Indirect Expenses	Percent Of Total Expenses	Total Operating Expenses
Domestic Trunk Airlines					
1946	\$127,411,526	40.18	\$189,709,954	59.82	\$317,121,480
1947	163,202,631	43.71	210,187,837	56.29	373,390,468
1948	189,790,818	46.15	221,486,955	53.85	411,277,773
1949	209,679,522	48.19	225,477,685	51.81	435,157,207
1950	225,237,388	48.80	236,300,592	51.20	461,537,980
1951	268,313,218	48.56	284,268,068	51.44	552,581,286
1952	337,578,804	50.17	335,320,095	49.83	672,898,899
1953 ¹	413,338,764	51.83	384,176,925	48.17	797,515,689
Local Service Airlines					
1946	\$ 996,175	48.35	\$ 1,064,254	51.65	\$ 2,060,429
1947	4,462,227	49.20	4,607,078	50.80	9,069,305
1948	8,321,371	52.26	7,602,141	47.74	15,923,512
1949	11,810,777	52.77	10,570,938	47.23	22,381,715
1950	13,699,877	49.24	14,120,854	50.76	27,820,731
1951	16,846,681	46.83	19,122,932	53.17	35,969,613
1952	20,943,373	48.15	22,553,894	51.85	43,497,267
1953 ¹	24,653,340	48.38	26,307,478	51.62	50,960,818
International Airlines					
1946	\$ 52,465,127	37.52	\$ 87,377,719	62.48	\$139,842,846
1947	93,765,717	44.80	115,527,815	55.20	209,293,532
1948	110,992,589	47.17	124,294,394	52.83	235,286,983
1949	122,333,638	48.38	130,529,491	51.62	252,863,129
1950	122,775,659	49.44	125,547,413	50.56	248,323,072
1951	129,221,191	47.88	140,643,907	52.12	269,865,098
1952	146,885,459	48.28	157,375,636	51.72	304,261,095
1953 ¹	150,960,828	48.13	162,668,116	51.87	313,628,944

Source: Air Transport Association, *Air Transport Facts and Figures*, 1954.

of all removable parts, including the wings, tail surfaces, landing gear, accessories, radio equipment, control system, and hydraulic system. All parts, including rivets, are then thoroughly inspected, and replacements are made wherever necessary. The skin is carefully gone over, and portions are replaced where cracks or scratches are found which might weaken its structure. Radio equipment and the airplane's inner wiring are removed, thoroughly inspected, and overhauled every 1,200 hours. Wheels and brakes are disassembled and overhauled every 400 hours. In addition to the major overhauls, of course, the aircraft are thoroughly inspected at frequent and regular intervals.

Ground and indirect expense provides for the administrative function of air transport production and includes the expenses of the officials in charge of operations, flight supervision, employment and handling of pilots, meteorology, schedules, and communications. It includes the expenses of operating maintenance shops, the office of the chief engineer, engineering staff, shop superintendents, inspectors, and the like. In addition, this group of accounts includes the expenses of all ground equipment maintenance.

The analysis of airline expenses has always been a difficult problem. The difficulty stems primarily from the fact that there has been insufficient data for normal periods over a substantial length of time to determine the effect which the various operating characteristics have on costs. For example, prior to the establishment of the Uniform System of Airline Accounts by the Board, no truly consistent compilation of cost statistics was available; and since the establishment of that system, the World War II period and its aftermath, with its abnormal economic characteristics, have severely affected the available data.

It is clear, however, that two airlines having the same characteristics of size, volume of traffic, and operations, but having a different number of stations, will experience different cost levels. The one having the larger number of stations should experience higher costs, other things being comparable. This results from a number of factors. In the first place, more stations must be manned. Always associated with any station are certain expenses which are relatively the same regardless of the volume of business handled; thus total station cost is primarily dependent upon the number of stations operated. In the second place, the larger the number of stations for a given route length, the shorter will be the average flight over that route. Simi-

larly, the shorter will be the average trip of the passengers flying over the route.

Shorter individual flights result in a larger percentage of ground time in taxiing and warming up. Furthermore, a larger number of take-offs and landings occur, and all these factors necessarily lead to a higher operating expense than would be encountered by an airline having a smaller proportion of such ground time and fewer take-offs and landings. Such elements make themselves felt very directly in maintenance expenses since they markedly affect the wear and tear upon the various parts of the aircraft, particularly the frame and engine.

Another effect which springs directly from the larger number of stations is a lower average block-to-block speed. Thus the covering of a certain number of revenue-miles of operation requires more flight time, with correspondingly higher direct expense both in terms of flying expense and maintenance, on the one hand, and depreciation of flight equipment, on the other, the latter by reason of the lower effective utilization in miles flown per day per aircraft.

The manner in which the above factors affect direct expense is quite clear. However, these same factors are also responsible for higher indirect expense. Consider, for example, the effect on costs of ground operations. Such operations involve dispatching, communications, and other factors which are primarily related to the time the aircraft spends between departure and arrival. It is obvious that, since communications must be maintained with the aircraft during all the time it is engaged in a flight, the load on such communications personnel and equipment will increase with any increase in the number of hours required to cover a given number of miles of operation.

Similarly, in the category of traffic and sales, the shorter the average haul of the passengers carried by the airline, the larger the number of tickets which must be sold for a given number of passenger-miles carried by the system for any given period of time. The mere issuance of a ticket requires the expenditure of funds in cost which are to a large extent independent of the length of the trip of that passenger. It is obvious that the sales personnel must be larger when a larger number of tickets are sold by the airline during a given period. Only a few examples of these effects have been mentioned; however, these same indirect costs noted above also cause still additional indirect costs. For example, a larger sales force requires more office space, with the correspondingly higher rental charges and other associated expenses. This is true for any function requiring a larger

number of personnel. As a result of the increased load due to the nature of operations and traffic, greater expenses are involved in the general and administrative category. Accounting expenses must necessarily increase, and the general supervision of all functions becomes more burdensome as the over-all personnel, equipment and load increase.

The nature of many airline routes is seasonal. High seasonal factors result in higher unit expenses in any type of business. This is so because the organization must be set up to handle, in some manner, the peak loads imposed upon the system; yet during periods of low activity only the more direct types of expenses may be reduced in accordance with the reduced volume of operations. For the operating staff of an airline there is required a group of people having experience and training for the specialized tasks. Such a staff cannot be varied from month to month without seriously impairing the efficiency and thus increasing the costs of operation. Such a procedure would result in excessive training expenses, together with a lower effectiveness of all personnel involved. It is common in any industry that the majority of functions cannot be reduced and increased to fully compensate for the seasonal elements.

All airlines experience serious operating problems from the standpoint of weather. Safe airline operation cannot always be conducted with the present technological status of the industry. The effect is reflected directly in the operating factor and the percentage of scheduled flights completed. Since an airline organization must be set up to handle the expected scheduled operations, any period of inactivity caused by bad weather means that the organization cannot be effectively utilized. It is clear that the organization must be geared to the scheduled operations since the bad-weather periods occur in essentially unpredictable frequency from the long-range standpoint. In other words, full scheduled operations do occur often for extended periods but are then rudely interrupted by periods of relative inactivity. Thus the low operating factor, which in some periods of the year is primarily the reflection of bad weather, also causes substantially higher unit costs, both direct and indirect.

The Relation of Airline Expenses to the Volume of Traffic

As previously indicated, airlines have relatively low fixed charges, particularly when compared to the railroads, since their airways cost them little and their airport facilities are generally provided at low cost by governmental agencies. Also, the high speed of aircraft less-

ens the amount of capital equipment required per passenger- or ton-mile over what would otherwise be necessary.

However, a substantial portion of airline costs are *constant* costs, in the sense that they do not vary in proportion to changes in the volume of business handled. Some of these are true fixed costs (but not fixed charges) in the sense that they would continue whether the firm operated flights or not; salaries of higher officials and some depreciation charges are examples. These will continue so long as the firm continues to exist, even if it suspends actual operations. But the bulk of the constant costs are not fixed costs but are the constant (as compared to the direct) type of variable cost—that is, one which will cease if the firm suspends operations but which will not vary directly in proportion to output. As suggested above, many of the station expenses are not adjustable to the volume of business; the same is true of those for supervisory, administrative, and clerical personnel. Many of these costs are not even closely dependent upon the number of flights.

In addition, with a given number of flights, up to the limit of plane capacity, the plane operating costs—fuel, wages, maintenance, etc.—are almost completely independent of the volume of passenger, freight, and other traffic handled. Just as a railroad requires about the same expenditures for fuel, wages of operating personnel, and maintenance of equipment whether a train carries five passengers or fifty and requires only a few additional ones if it carries five hundred, so an airline will pay out almost the same amounts for plane operation and maintenance regardless of the loads handled, with a given number of flights. These plane operating costs will, of course, increase if traffic rises to the point at which additional flights must be added.

Thus, with a given number of flights, the only actual *direct* variable costs—those changing more or less in direct proportion to changes in volume of business—are those resulting from the selling of additional tickets, serving of more meals, use of some additional fuel because of the greater weight, etc. And so the *marginal cost*—the addition to total cost from the handling of the additional units of business—is extremely small. As the average load carried per flight rises, the average cost per ton—or passenger-mile drops very sharply, since the total of the constant costs is being spread over more units. As business is expanded to the extent that additional flights are necessary, the plane operating costs will rise, in total, more or less in proportion to the additional business. But the other constant costs—those

not directly dependent upon the number of flights—will not increase in proportion, and average cost will continue to decline. Likewise, over a longer period, as an airline continues to expand, it may be able to realize some economies of large-scale production, especially the use of larger-capacity planes and the introduction of increased specialization in management. Thus it may obtain still further reductions in average cost per ton- or passenger-mile.

Common and Separable Costs

When airlines handle more than one type of traffic—passenger, mail, express, freight—as they usually do, a portion of their costs are *common*³ among the various types, since no one of the types of traffic is responsible for any particular part of these costs. For example, if particular flights handle freight, passengers, and express, the costs of the plane operation are common among the three. No one of the three is responsible for any particular part of the wages of the pilot or the fuel costs, except to the extent that the latter are increased from the greater weight resulting from the carrying of the particular type of business.

Not all airline costs are common, however. The wage of the stewardess, for example, is a *separable* cost for which the passenger service alone is responsible. The costs of selling tickets or of soliciting freight and the costs of handling the freight and express are separable costs.

Within each general category of service, likewise, some of the costs may be common. If a number of different types of freight are handled, a portion of the costs separable to the freight as a whole will be common among the various products. This is true likewise if separate aircraft are maintained for freight operation alone; all the operating costs of these aircraft are chargeable to freight, but many are common among the various types of commodities handled.

Much confusion has arisen over the relationship of the concept of marginal cost, so widely used in economic analysis today, and separable cost per unit of traffic, or *out-of-pocket cost*, the latter term generally being employed in transportation industries. Marginal cost consists of the addition to total cost resulting from the production of an

³ The term "common costs" is used rather than "joint costs" because the latter term is usually applied to costs incurred in the production of two or more commodities so related that an increase in the output of one is necessarily accompanied by an increase in the output of the other. In general, airline costs are not joint in this sense, to any extent. The handling of more passengers does not necessarily involve the handling of more freight also.

additional unit of output—the carrying of an additional passenger, for example. On the other hand, out-of-pocket cost per unit of business consists of the total separable cost for which the type of traffic is responsible, divided by the number of units of the traffic handled. Frequently, in reference to a relatively short period of time, only those separable costs which are variable costs are included in calculating out-of-pocket cost.

In any type of business, there is no necessary way in which the total common costs must be allocated among the various products or types of traffic. Frequently, business firms will make allocations for various purposes; but these are, of necessity, arbitrary.

The portion of total airline costs consisting of common costs appears to be very high, under typical operations. Evidence submitted by United Airlines in the *Air Freight Rate Investigation*⁴ indicated that 61.4 per cent of the company's total costs were incurred not directly for any particular service but for all forms of traffic together. A similar computation by American Airlines indicated that 76 per cent of that carrier's total costs consisted of common costs.

The Theory of Rate Making for Air Transportation

To present a simple theory of rate making for the air transport industry is not an easy task. Many of the problems are comparable to those relating to other carriers, around which controversy has centered for many years. Only a brief summary statement is possible.

In general, airline managements seek to attain the maximum profit possible. The intent of regulatory policy is that actual profit earned should not exceed a “normal” or “fair” rate of return on capital investment, comparable to the profit which can typically be earned in competitive industries. So long as the maximum profit which the airlines can make under existing conditions is less than a normal return, as has probably been the typical situation in the industry, there is no general conflict between the aims of regulatory policy and those of the companies, although disagreements may arise over relative rates for different services; and those services which would provide maximum contribution toward profit may sometimes be considered contrary to public welfare. If situations permit the airlines to earn an excess return, however, a real conflict arises, since regulatory agencies will attempt to hold the general rate level below that desired by the companies.

The principle has generally been accepted that, both from the

⁴ CAB Docket No. 1705 *et al.* (1948).

standpoint of the airlines themselves and the public interest, rates should never be allowed to fall below the out-of-pocket cost on the particular traffic.⁵ This rule has generally been followed in the regulation of railroad rates and to some extent in the case of motor carriers.⁶ If for example, rates on air express were set so low that the total revenue received from express was less than the separable cost for which express service is responsible—that is, the amount of reduction in total cost possible if express service were eliminated—the carriers would be better off without the traffic at all. Express traffic would drain revenue away from other services and lead to higher rates on the latter or leave the companies unable to cover all costs. This rule, that rates should not fall below out-of-pocket cost, is applicable to all types of airline service. Ordinarily, of course, a company itself will not knowingly set rates at lower levels. But forces of competition may sometimes lead them to do so, especially when they have high constant costs and are anxious to maintain volume. Continuous rate reductions to meet those of competitors may pull the rates below the out-of-pocket figures before the airlines realize it, or the companies may deliberately set rates at such levels in an attempt to drive competitors out of business. Such reductions should be prevented by regulatory action.

As indicated above, the maximum over-all level, with sound regulatory policies, is one which will allow the air carriers to earn an average rate of return on their investment. Only with such a return can they continue to operate satisfactorily. Return in excess of this figure represents an unnecessary burden on the users and restricts the use of the services below optimum economic levels.

It is entirely possible, however, that, even if the airlines are allowed to set maximum-profit rates, they will not be able to earn excess profits or, perhaps, even an average rate of return. As indicated above, this has been the typical situation in the air transport field in the past. Under such circumstances, the rates on each type of service

⁵ The high percentage of total cost, which consists of common cost, in the air transport industry makes the use of out-of-pocket costs as a minimum particularly justifiable.

⁶ In the case of motor carriers, and especially the truck lines, the great bulk of all costs are direct, varying closely with the volume of traffic, since the relationship between truck capacities and available business is usually such that near-capacity operation can be attained, except on very light density runs. Additional traffic handled therefore raises total cost more or less in proportion to the increase in traffic, and thus the out-of-pocket cost of additional traffic is not substantially less than the "full" or average cost of handling all traffic. Thus, more attention has been given in rate making to full cost and less to out-of-pocket cost, since the spread between the two is slight. It is sometimes argued that the airline industry is comparable to the trucking industry in respect to cost behavior; but this statement is not borne out by the facts.

should—from the standpoint of both the companies and the public welfare—be set at levels which will maximize the contribution of the service to the profits of the firm. In recent years, however, some economists have questioned this principle and argued that the rates on each service should be set at the level equal to marginal cost. This question is discussed below. Just as with any product, two considerations determine the optimum profit rate level. The first is cost; the second is demand for the product, or “value of service.”

As shown previously, at least over a substantial range of traffic, total cost does not increase as rapidly as traffic; and thus average cost per unit of business handled falls. In general, this behavior of cost is due to better utilization of equipment and personnel as business increases; it is impossible to adapt this principle to small volumes of business at all exactly. Over a longer period, likewise, larger business allows utilization of better types of equipment and increased specialization. It is very important to note that the extent to which cost per unit of business falls as traffic increases is much greater up to the limit of existing flight capacities, when the latter are not fully utilized, than when additional flights are required to handle the added business. In other words, the marginal cost of additional units of business is relatively low, especially up to the capacity of existing flights and even, though to a lesser extent, beyond this, compared to the average cost per unit of handling the business. Because of the nature of the cost behavior, the airlines have particular incentive to gain additional business by all possible means, especially in order to increase the average load factor on their flights. This situation is an incentive toward lower rate levels than might be desirable if total costs increased in proportion to business handled.

But cost alone cannot be used as a basis for setting rates; both the airlines and the regulatory agencies⁷ must take into consideration the demand for the service—the “value of the service” to the user. This demand is not a fixed quantity, but rather a schedule of the quantities of the service which users will employ at various possible rate levels. In general, as rates for airline service of any type are reduced, the

⁷ The Civil Aeronautics Board is required by law to consider in the fixing of rates “the effect of such rates upon the movement of traffic” (Civil Aeronautics Act, sec. 1002[e]). The same problem confronts the railroads; in one of its earliest cases the Interstate Commerce Commission said: “The value of the service is generally regarded as the most important factor in fixing rates” (*Imperial Coal Co. v. Pittsburgh and L.E.R. Co.*, 2 ICC 436 (1889)).

As stated by D. Philip Locklin (*Economics of Transportation* [Chicago: Richard D. Irwin, Inc., 1947], p. 154), “. . . nothing could be more unscientific than an attempt to base rates on cost in disregard of conditions of demand.”

volume of business will increase. Travelers will shift from other forms of transportation to the airlines; some persons may decide to travel who would not have otherwise done so at all. Likewise, as rates are reduced on air freight, increased amounts of traffic will shift from the surface carriers to the airlines. No data is available on the exact elasticity of demand—the relative extent to which the volume of business changes as rates are changed—for airline service; but there is reason to believe that the elasticity is relatively high, because of the existence of substitute forms of transportation. The actual quantities of service which customers will obtain at particular rates depend upon a number of considerations: the nature and quality of competing services, the quality of the airline service, its reliability and freedom from accidents, the importance which the customers attach to greater speed, the rates charged by the competing carriers, the sales activities of the airlines, etc.

Thus, in setting rates on particular types of service, the airlines must seek to estimate the costs with various quantities of traffic and the schedule of amounts of service which customers will obtain at various possible rate levels. Then, by considering the relationship of these two schedules, they can select the rate figure which will maximize the profit from the particular service. In terms of technical economic analysis, they must select the rates on each commodity which will allow equality of marginal cost and marginal revenue.

It is, of course, difficult for the airlines or the regulatory agencies to estimate either cost or demand schedules with any high degree of accuracy, but they must base their actions upon the best estimate which they can make. The same rule applies to all services provided and to particular types of the individual services, with the exception of mail. No estimates of value of mail service are possible (other than the postal charge and consumer use of it), since there is a single buyer—the government itself. At the present time, of course, legislation provides other means for setting mail rates. But apart from this legislation, some special basis must be set up, involving an allocation of common cost to mail service on some basis consistent with general welfare, because the government is the sole user and postage rates are set by act of Congress.

When rates set on the basis indicated yield no more than an average over-all rate of profit, ordinarily no readjustment of rates by regulatory agencies will be necessary. There are some exceptions, however. Optimum-profit policies may result in setting rates regarded as discriminatory. On some types of business, competition may be

much more severe than on others and may lead to substantially lower rates on the former than on the latter, with resulting discrimination between the customers of the two services. For example, suppose that an airline operated routes out of Chicago to two cities each 500 miles away. On one route, railroad freight service was excellent; on the other, it was very slow. The airline, in order to obtain air freight business on the former route, would have to set lower rates than on the latter, despite the fact that distances were comparable. Shippers in the city served by the second route would, of course, argue that they were discriminated against. Discrimination cases are very difficult to decide; there is probably a limit, however, beyond which discrimination is contrary to the best interests of the economy.

When the rates set yield an excess rate of profit, regulatory agencies must, of course, compel rate reductions in the interest of the economy. But such reductions need not be uniform on all services; the decisions as to relative reductions must be based upon considerations of national policy.

Once rate levels have been set on the bases indicated, the various services are likely to yield substantially different relative contributions to common costs. The actual contribution in each case depends largely upon the "value of the service," as reflected in the demand for it. If a service cannot cover its out-of-pocket costs regardless of the rate set, it should be abandoned, unless continued operation is essential to the general welfare. Passenger service in thinly populated areas might be so regarded. So long as a service covers more than out-of-pocket cost, continued operation is clearly desirable, even if its contribution toward the covering of common cost is relatively small. In the railroad industry, for example, passenger traffic as a whole contributes relatively little to common cost; it cannot cover its share of the latter allocated on any usual basis. And yet, so long as it more than covers the out-of-pocket cost for which it is responsible—as it presumably does—it yields something toward covering common costs; and discontinuance would lessen the total profit earned by the railroads. The Interstate Commerce Commission, by arbitrarily allocating a share of common cost to railroad passenger service, makes the latter appear to result in a loss, for almost all railroads. Such procedure is misleading, as the railroads would be worse off, in all likelihood, if they abandoned all passenger operations.

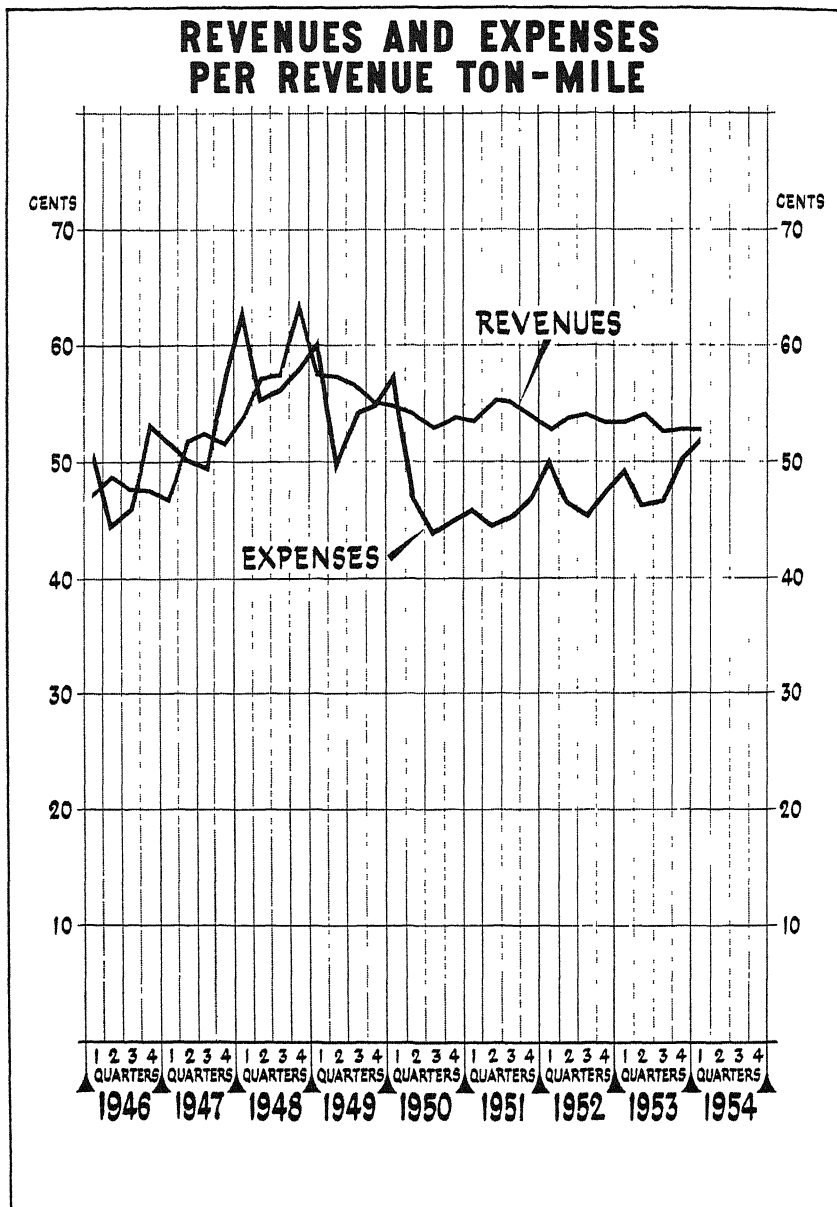
In the case of the airlines, it is very likely that the freight service will contribute relatively less to common cost than the passenger and other services. Speed is probably less important, on the average, to

the shipper than to the traveler; choice of type of carrier is based more closely on relative costs in the case of freight shipments by business firms. However, so long as air freight yields more than its out-of-pocket cost, the airlines are better off providing such service than discontinuing it.

In recent years some economists have questioned the principle that utility rates should be set at levels designed to insure an average rate of return. Instead, they have argued that optimum organization of production, from the standpoint of public welfare, requires that rates for each type of service be adjusted so that the rate is equal to the marginal cost of the service.⁸ However, in many cases such a policy would result in continuing losses for the companies; the government would be compelled either to take over operations or to continue subsidizing the private operations. Either policy would be accompanied by obvious disadvantages; the collection of taxes necessary to cover the deficits or subsidies might produce serious adverse effects on the economy and more than offset such gains as might be obtainable from theoretically improved utilization of resources.

As indicated earlier, airline costs are substantially higher, per ton-mile, than those of surface carriers. As a consequence, airline rates have typically been higher. Because of the advantages of speed, of course, substantial business has been gained by the airlines despite the rate differential. But the rate of growth of the air transport industry would, without question, have been much faster had lower costs and rates been possible. The gap between air and surface fares and rates has been narrowing for a number of years. However, further reductions are desirable only insofar as they actually result in increased profit and reduction in government subsidy. Decreases designed merely to increase the volume of business and resulting in increased losses and greater government subsidy are contrary to the best interests of the carriers themselves, the government, and the economy as a whole. Whether future reductions in fares and rates are possible depends upon the ability of the airlines to maintain a downward trend in capacity costs (costs per available ton-mile) and at the same time hold steady or force upward the traffic capacity relationship (load factor). The narrowing gap from 1946 to 1953, between the revenue and expenses per ton-mile, both "revenue" and "available," is shown in Fig. 26. The effect of a 1 per cent change in

⁸ This point of view was stressed by H. Hotelling, "The General Welfare in Relation to the Problems of Taxation and of Railway and Utility Rates," *Econometrica*, July, 1938. For an extended discussion see E. Troxel, *Economics of Public Utilities* (New York: Rinehart & Co., 1947), chap. xx.



Courtesy: Air Transport Association

FIG. 26. Operating expense and revenue per ton-mile for domestic trunk lines, 1946-54.

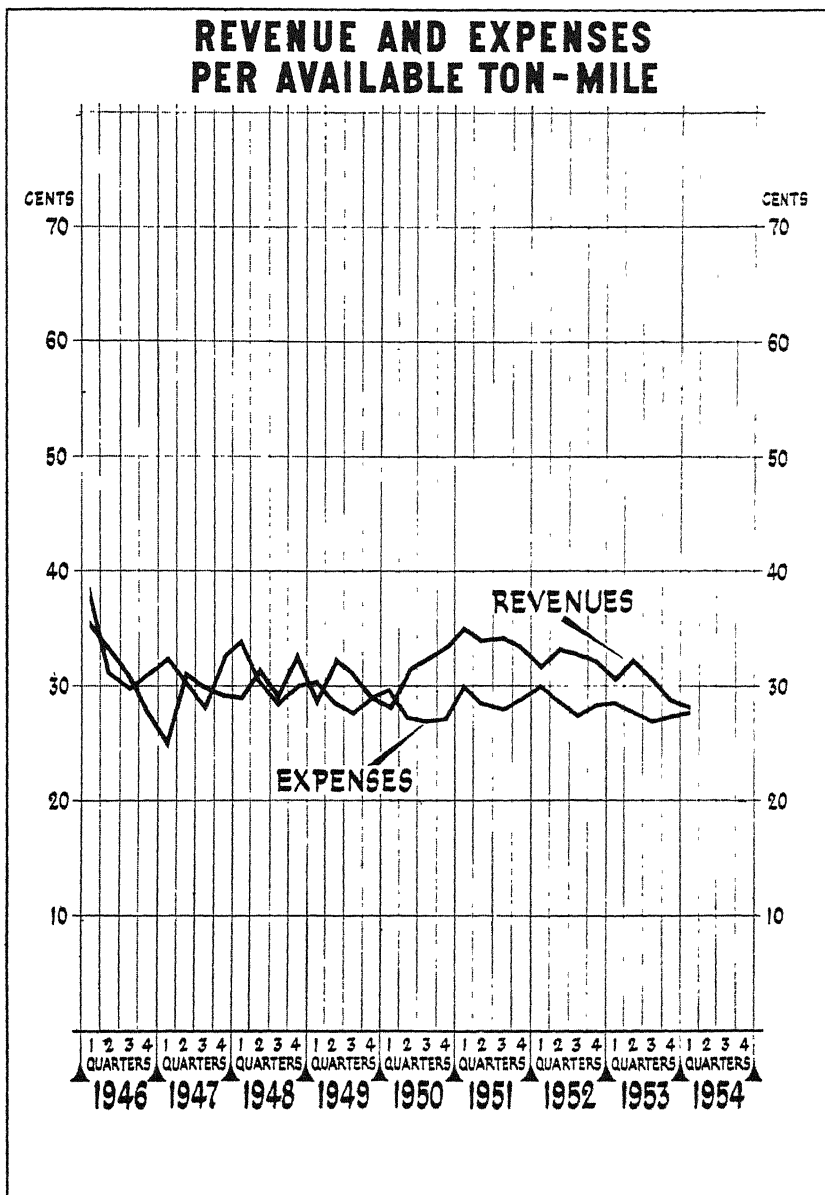


FIG. 26. Continued.

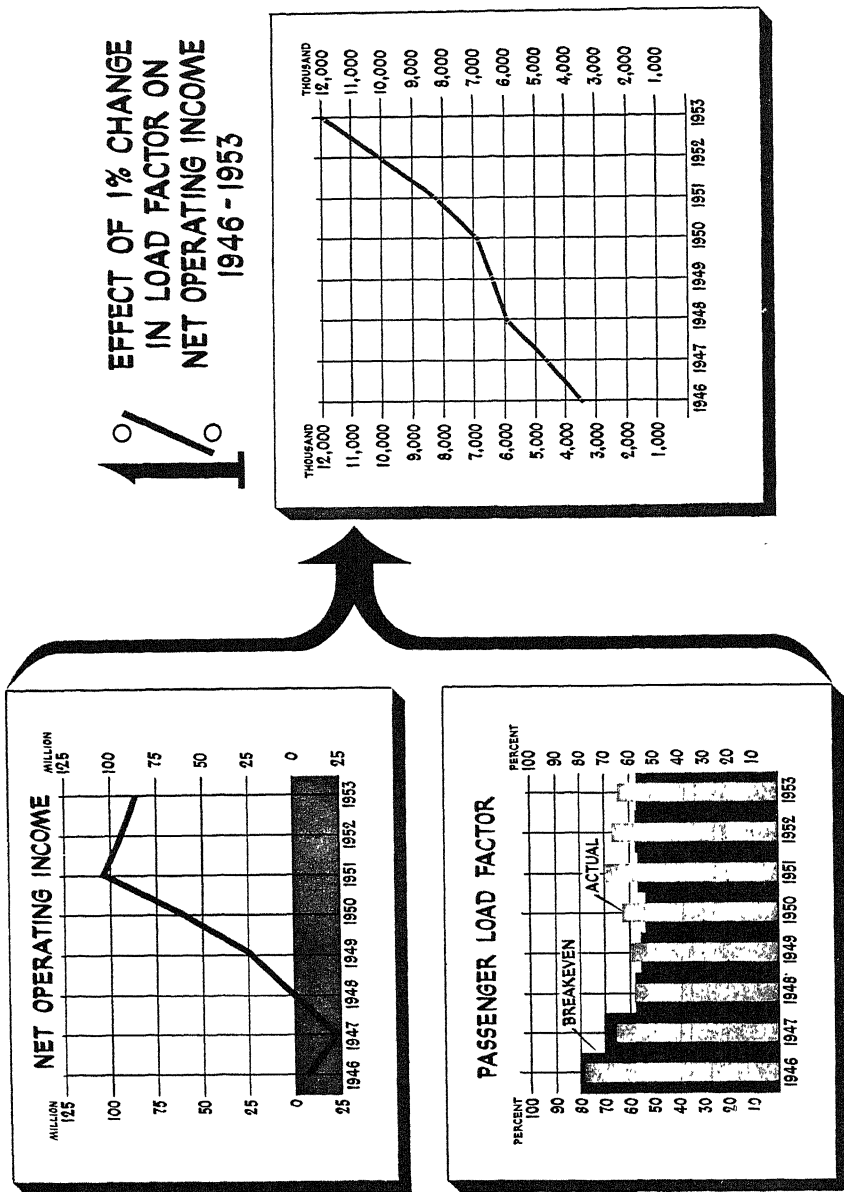


FIG. 27. Effect of passenger load on net operating income, 1946-53.

Courtesy: Air Transport Association

TABLE 25
EFFECT OF PASSENGER LOAD FACTOR ON AIRLINE OPERATING PROFIT, 1946-53

	OPERATING PROFIT (000)	PASSENGER LOAD FACTOR			EFFECT OF 1 PER CENT CHANGE IN LOAD FACTOR ON OPERATING PROFIT (000)
		Actual	Breakeven	Difference	
1946 .	\$ 5,228*	78.81	80.32	1.51	\$ 3,462
1947	20,900*	65.67	70.20	4.53	4,614
1948	2,075	58.34	57.99	0.35	5,929
1949	24,625	59.10	55.24	3.86	6,380
1950	62,571	62.70	53.58	9.12	6,861
1951	105,940	69.59	56.68	12.91	8,206
1952	95,537	67.08	57.54	9.54	10,014
1953	87,377	64.65	57.33	7.32	11,937

* Indicates a negative figure.

Source: CAB *Annual Airline Statistics and Recurrent Reports*, Air Transport Association.

load factor on total airline net operating income between 1946 and 1953 is shown in Table 25 and Fig. 27. A decline of only 1 per cent in 1953, for example, would have caused a decrease in airline net income of approximately \$12 million.⁹

⁹ For an analysis of the variables which affect airline costs: (a) capacity of the plane; (b) length of the flight; (c) ton-mile load factor; (d) number of hours per day planes are utilized; (e) metropolitan population served; (f) average speed of planes; and (g) net assets of each firm see Jesse W. Proctor and Julius S. Duncan, "A Regression Analysis of Airline Costs," *Journal of Air Law and Commerce*, Summer, 1954.

Chapter

6 * CIVIL AERONAUTICS BOARD POLICY— COMPETITION¹

PROVIDED with the means for regulating air transportation by the Civil Aeronautics Act of 1938, the Civil Aeronautics Board was faced with the problem of operating within the limits of the inherent economic characteristics of this new industry and, in so doing, soon discovered that it could make little use of analogy to other fields of public utility regulation. (See Chapter 5.)

A limited air traffic potential and the relative ease with which, at the time, new concerns could enter the industry produced the competition and economic instability among the smaller operators that characterized the industry in the years just prior to the passage of the Act of 1938. At the same time, the operational advantages of large aircraft and the importance of a high utilization of available plane space were creating an ever-tightening core of oligopoly within the industry.² That is, only a small number of airlines were doing the

¹ See Neil G. Molone, "Controlled Competition: Three Years of the Civil Aeronautics Act," *Journal of Air Law and Commerce*, July, 1941; J. Howard Hamstra, "Two Decades—Federal Aero-Regulation in Perspective," *Journal of Air Law and Commerce*, April, 1941; Howard C. Westwood, "Choice of the Air Carrier for New Air Transport Routes," *George Washington Law Review*, December, 1947, and February, 1948; Frederick A. Ballard, "Federal Regulation of Aviation," *Harvard Law Review*, October, 1947; James M. Landis, "Air Routes under the Civil Aeronautics Act," *Journal of Air Law and Commerce*, Summer, 1948; Joseph L. O'Connell, Jr., "Legal Problems in Revising the Air Route Pattern," *Journal of Air Law and Commerce*, Autumn, 1948; Louis E. Black, Jr., "Realignment of the Domestic Airline Route Pattern," *Journal of Air Law and Commerce*, Autumn, 1948, and Winter, 1949; "Civil Aeronautics Board Policy—An Evaluation," *Yale Law Journal*, April, 1948; Edward C. Sweeney, "Policy Formation by the Civil Aeronautics Board," *Journal of Air Law and Commerce*, Spring, 1949; F. W. Gill and G. L. Bates, *Airline Competition* (Boston: Harvard Graduate School of Business Administration, 1949); David W. Bluestone, "The Problem of Competition Among Trunk Airlines," *Journal of Air Law and Commerce*, Autumn, 1953, and Winter, 1954.

² The members of this oligopoly were American Airlines, United Air Lines, Transcontinental and Western Air (now Trans World Airlines), and Eastern Air Lines.

greater part of the business between the chief traffic-generating cities. Such a development was advocated by the major lines as the cure for the ills of destructive rivalry. This cure was, however, but another illness, for in it lay the germs of monopolistic inefficiency, lessened emphasis on improved technology and reduced cost, and the maintenance of inflexible rate schedules. To cope with this abnormal situation—the existence of cutthroat competition and oligopoly in the same industry—the type of regulation introduced by the Act of 1938 seemed imperative if air transportation was to develop and become an important part of our national transportation system.

Competition

The Civil Aeronautics Act provides that before a new or additional air transport service can be authorized the Civil Aeronautics Board must find that such service is required by the “public convenience and necessity.” Under the so-called “grandfather” clause,³ carriers already operating at the time the act was passed were granted certificates for routes which they had served in continuous operations as air carriers from May 14 to August 22, 1938, unless the service was inadequate or inefficient. New trunk-line routes authorized since 1938 have been largely improvements in, or additions to, this basic statutory grandfather-route pattern.

Except the routes covered by the grandfather clause, authorizations for service between the United States and foreign countries, whether granted to foreign-flag carriers by “permit” or to American-flag carriers by “certificate,” have become effective only if approved by the President of the United States as well as the Board. During the period in which the foreign air services have been in the process of authorization, the State Department has been negotiating with many foreign governments for appropriate intergovernmental agreements under which these services could be conducted. Agreements providing for the exchange of commercial operating rights on a reciprocal basis have been concluded with most of the countries to which United States-flag lines are certificated. (See Chapter 10.)

The principal factors which the Board is directed to consider in determining public convenience and necessity are set forth in the declaration of policy incorporated in the act.⁴ This declaration of policy makes the present and future needs of United States commerce, the postal service, and the national defense the primary criteria by which

³ Civil Aeronautics Act, sec. 401 (e) (1). See Appendix A.

⁴ Civil Aeronautics Act, sec. 2. See Appendix A.

the Board determines whether a particular proposal meets public convenience and necessity. Among the other general policy intentions of Congress set forth in the act is the explicit declaration in favor of competition to the extent necessary for assuring the sound development of an air transportation system adequate to our national needs.

In its first new route case⁵ the Board, after reciting the declaration of policy contained in the act, discussed the position it was taking with respect to the authorization of new or additional service in the following language:

Obviously, in the light of these standards, it was not the congressional intent that the air transportation system of the country should be "frozen" to its present pattern. On the other hand, it is equally apparent that Congress intended the Authority to exercise a firm control over the expansion of air transportation routes in order to prevent the scramble for routes which might occur under a "laissez faire" policy. Congress, in defining the problem, clearly intended to avoid the duplication of transportation facilities and services, the wasteful competitive practices, such as the opening of nonproductive routes, and other uneconomic results which characterized the development of other modes of transportation prior to the time of their governmental regulation.

In this case, together with the opinions in two other early route proceedings,⁶ the Board outlined some of the fundamental considerations which govern the disposition of new route applications, as follows: (a) whether the new service will serve a useful public purpose, responsive to a public need; (b) whether this purpose can and will be served as well by existing lines or carriers; (c) whether it can be served by the applicant without impairing the operations of existing carriers contrary to the public interest; and (d) whether the cost of the proposed service to the government will be outweighed by the benefit which will accrue to the public from the new service.

In what is perhaps the leading case on the subject of competition,⁷ the Board further elaborated its statement of general policy on competition. After stating that competition was not mandatory in relation to any particular route or service and that it lay in the Board's discretion to decide the issue in accordance with the peculiar circumstances of each case, the opinion outlined specific considerations for ending Pan American Airways' monopoly in the trans-Atlantic service. Among other things, it pointed out that there was sufficient avail-

⁵ *Duluth-Twin Cities Operation*, 1 CAA 573 (1940).

⁶ *Red Bluff Operation*, 1 CAA 778 (1940); *St. Louis-Nashville-Muscle Shoals Operation*, 1 CAA 792 (1940).

⁷ *American Export Case*, 2 CAB 16 (1940).

able traffic at that time for two successful operators in the trans-Atlantic field, that competition not only would result in improved service but would also act as a stimulus to the development of better equipment and operating methods, and that the national defense would benefit from such competition since the research and development by foreign competitors would not be available to the national defense of this country.

Increased competition in the air transport industry is created by various Board actions: (a) the extension of existing carriers into territory already served by other carriers; these may be authorized either to improve a long-distance service or to provide competition; (b) the certification of new carriers; (c) changes in operations arising from route consolidations and one-stop authorizations, these being granted primarily to take advantage of technological developments; and (d) the permission of operations by certain carriers who have been exempted from the provisions of the act. There has also been a considerable increase in the amount of foreign competition our carriers meet on international routes. This is the result of our government's granting reciprocal rights in order to obtain operating rights for our carriers from foreign countries.

Soon after its establishment, the Board evolved a policy⁵ on competition which seemed to be predicated on a stratification of the airlines into categories based on common economic characteristics, with the object of maintaining "balanced competition," as opposed to undue rivalry, within each of these classifications and of gradually strengthening the smaller carriers by the addition of new routes and the extension of existing ones.⁹ Apparently the Board thought that such a policy would place the smaller airlines on a sounder basis to compete with the paralleling sections of the larger systems. This theory would also imply that there should be no "super-carrier" or "chosen instrument"

⁵ This policy was first stated in *United Air Lines Transport Corp., Acquisition of Western Air Express*, 1 CAA 739 (1940).

⁹ See *Mid-Continent Airlines, Kansas City-New Orleans*, 6 CAB 253 (1945), to strengthen Mid-Continent; *Colonial Airlines, Washington-Ottawa-Montreal*, 6 CAB 481 (1945), to strengthen Colonial; *Colonial Airlines, Atlantic Seaboard Operations*, 4 CAB 552 (1944), strengthening National Airlines to compete between New York City and Miami, Florida, with Eastern Air Lines; *Milwaukee-Chicago-New York Restriction Case*, 11 CAB 310 (1950), strengthening Capital Airlines by permitting additional nonstop service between New York, Chicago, Detroit, and Cleveland. In this case see particularly the dissenting opinion of member Jones for a discussion of Board policy as to "conviction that weak carriers must be strengthened by taking away from the stronger" and "competition for competition's sake."

exploitation of any specific market¹⁰ for air transportation. Presumably the Board's aim has been to allow the development of an air transport system composed of relatively self-sufficient units, without too much difference in economic power and able to exist with a more or less common level of rates. This aim is, of course, a Utopian one, and the history of other forms of transportation points out the difficulties of its attainment. With the certification of new local-service lines and cargo carriers, existing difficulties are multiplied. Any increase in the number of airlines, or in air service rendered by other operators, complicates the problem of achieving anything like "balanced competition." The easiest and surest way to create such a competitive situation is the reduction of the number of operators through consolidation.¹¹ But, unless consolidations are forced, the likelihood of progress along that path is at best doubtful. The reason for this is that consolidations of the type most likely to occur voluntarily and most likely to result in strong new airlines—those between very large and very small carriers—have been and continue to be those which encounter the most opposition from competitors and from the Board itself.¹²

Unfortunately, airline routes authorized pursuant to the Act of 1938, like the services established prior thereto, were not consciously planned on an over-all route basis. They were awarded almost always as applied for by interested carriers. That is not to say, however, that the carriers failed in all or most cases to apply for routes and services they considered best for the public, as well as their own private interests; but a planned pattern, promoted by the Civil Aeronautics Board or a disinterested nongovernmental agency, would have provided some guidance to the carriers in applying for new or additional services and have helped to set a standard, in terms of costs and expect-

¹⁰ "The question whether as a matter of policy United States international air transportation shall be rendered by a single company or by a 'chosen instrument' . . . was settled by Congress in the Civil Aeronautics Act of 1938 when . . . Congress provided that this Board in its decisions in new route cases, both domestic and international, should consider as being in the public interest . . . 'competition to the extent necessary. . . .'" (*Northeast Airlines, North Atlantic Routes*, 6 CAB 319 [1945]). Pan American Airways' claim to "chosen instrument" status has always been opposed by all domestic carriers except United Air Lines, which has based its position on the alleged insufficiency of trans-ocean traffic to warrant competition.

¹¹ It was this very goal which Congress sought to achieve for rail transportation through the encouragement of railroad consolidations under a plan provided for in the Transportation Act of 1920, to be set forth by the Interstate Commerce Commission.

¹² See *Acquisition of Western Air Express by United Air Lines*, 1 CAA 739 (1940); *American Airlines, Acquisition of Control of Mid-Continent Airlines*, 7 CAB 365 (1946); *Eastern-Colonial, Acquisition of Assets*, CAB Docket No. 5666 (1954); *National-Colonial Integration Investigation*, CAB Docket No. 5569 (1954).

able traffic, by which additions to the "grandfather" network could be economically made. Certainly it would have helped to limit the strong competitive scramble for new route certifications near the end and after the close of World War II.

Not until 1949 did the Board order route-pattern studies which might serve as guides to both the Board and the industry in their joint endeavor to develop the most desirable kind of an air transport system.¹³ Obviously, it would have been easier to follow a planned pattern when the need for certification of new or additional air routes arose after the organization of the Board in 1939 than it will be now to revise or reduce, as may be necessary, the vast network of routes already authorized.

It is imperative to note that the traffic used to determine whether competition is in the public interest is the total traffic available to a system, rather than the volume available on particular route segments. In measuring the need for competition in local or intra-regional services for a limited area, attention must likewise be paid to the total traffic which the area may be expected to generate, rather than to the travel segments which, standing alone, may or may not generate enough traffic to warrant duplication. In other words, it is necessary to determine whether such an area is likely to produce enough total traffic to support more than one local or regional carrier, even though it is physically and operationally possible to authorize service to multiple carriers, each serving separate portions of the area, without direct or paralleling competition for identical routes.

It is all too easy to draw the analogy between the corner grocery and an air carrier and to conclude, as indeed some of the permanently certificated carriers have done in their struggle for additional routes, that, since two or more neighborhood grocery stores may better serve the public, both pricewise and servicewise, than only one, competition in air transportation will be similarly beneficial. While air transportation is more subject to competitive development than a street railway or a gas or electric company, it is, like the latter services, basically a public utility, with many of the attributes of the regulated public utility industries. Investment in plant (aircraft, spare engines,

¹³ Civil Aeronautics Board, *Economic Program for 1949, Statement of Policy*, issued February 21, 1949. In part, these studies were undertaken in response to findings of the President's Air Policy Commission and the Congressional Aviation Policy Board of the 80th Congress. See *Survival in the Air Age, A Report by the President's Air Policy Commission*, January 1, 1948, pp. 110-16; *National Aviation Policy* (Sen. Report No. 949, 80th Cong., 2d sess.) (Washington, D.C., 1948), p. 25. Basic to these findings was the unsatisfactory financial status of several air carriers and their mounting requirements for government financial aid.

and the like) and equipment (hangars, repair shops, and service facilities), although less than with other types of carriers, is still substantial. Direct duplication of such investment can be justified only where both the new and existing carriers may be expected to develop a sufficient volume of business to avoid an unreasonable increase in total operating costs. Moreover, the certificated carrier is obligated to perform the services for which it receives authorization, often without regard to their profitability.

The provision of local or intraregional services by more than one carrier involves readily recognizable costs (or so-called "wastes" of competition) in the duplication of overhead organizations, ticket offices, etc. On the other hand, the industry and the Board have long acknowledged the costs or wastes of monopoly or noncompetitive service. The latter, of course, are much more difficult to identify. They are to be found in lack of care and economy in operating expenditures for the want of comparative yardsticks and in failure to provide adequate service and develop new markets.¹⁴ But it takes no great understanding of air transport economics to appreciate that competition can develop greater wastes than the lost opportunities of single-company service where lack of traffic or inherent difficulties of operation make duplication uneconomical.

The choice in all new route proceedings under the act is not the simple one between "competition" and "monopoly" as such. The act makes it clear that the question is whether such competition—or additional competition—as is proposed is *necessary* to assure the sound development of the industry. Competition is not an end in itself. It should foster sound economic conditions in the industry. Obviously, too much competition can be as much or more of an evil than too little.¹⁵

¹⁴ "It is generally recognized that economic regulation alone cannot be relied upon to take the place of the stimulus which competition provides in the advancement of technique and service in air transportation. Competition invites comparison as to equipment, cost, personnel, organization, methods of operation, solicitation and handling of traffic, and the like, all of which tend to insure the development of an air transportation system as contemplated by the Act. That the domestic air transportation system of this country has reached its present position of pre-eminence is in large part due to the competitive spirit which has existed throughout its development. The continued maintenance of that position as well as the further development of the industry demands the encouragement of free initiative and enterprise subject only to the condition that the competitive services shall not be wasteful" (*Colonial Airlines et al., Atlantic Seaboard Operation*, 4 CAB 552, 555 [1944]). These or like virtues of competition have been urged upon the Board by proponent carriers seeking to duplicate or parallel existing services in almost every major new route proceeding before the Board in recent years.

¹⁵ The Board's own investigations of New York-Detroit, Chicago-Washington, Twin Cities-Washington, and Detroit-Washington services instigated in 1949, the study by

Entry into Air Transportation

The Board was called upon early in its experience to formulate a policy for dealing with the new companies proposing to engage in air transportation. Soon after the Act of 1938 became effective, great numbers of applicants, attracted by the apparently limitless prospects for air commerce as well as by the opportunity for obtaining air mail pay, began to request certificates of convenience and necessity. These requests were both to serve new territories and to compete with existing airlines between cities already certificated. The first action of the Board on the question of entry of new companies into air transportation was encouraging to those hoping to become airline operators. A certificate of convenience and necessity was granted to a new firm, American Export Airlines, to operate trans-Atlantic service in competition with the so-called "benevolent" monopoly of Pan American Airways;¹⁶ and a bit later the Board issued another certificate to a newly organized company, All American Aviation, to operate a pick-up device for air mail carriage which eliminated the necessity of a landing.¹⁷ These Board actions seemed to establish the principle that the existing air carriers, who had all received permanent certificates under the "grandfather" provisions of the Civil Aeronautics Act,¹⁸ were not to be given preference in the development of new services. Only six months after the decision in the All American case, however, the Board laid down a rule of exclusion which for some time dominated its policy on certificating new operators. The Board held

Frederick W. Gill and Gilbert L. Bates, *Airline Competition* (Boston: Harvard School of Business Administration, 1949), and the Report of the Congressional Aviation Policy Board, *National Aviation Policy* (Sen. Report No. 949, 80th Cong., 2d sess.) (Washington, D.C., 1948) all show beyond question that excessive competition and extensive new route certifications are among the primary causes of economic instability in the air transportation industry. See also, Russell B. Adams, "The Air Route Pattern Problem," *The Journal of Air Law and Commerce*, Spring, 1950; M. George Goodrick, "The Air Route Problem in the United States," *Journal of Air Law and Commerce*, Summer, 1951.

¹⁶ *American Export Airlines, Certificate of Public Convenience and Necessity*, 2 CAB 16 (1940).

¹⁷ *All American Aviation, Certificate of Public Convenience and Necessity*, 2 CAB 133 (1940). In this decision the Board was unequivocal in its statement that "any such theory as advocated by the interveners (Transcontinental and Western Air and Eastern Air Lines), which would result in reserving solely for existing airlines the privilege of providing all additions to the present air-transportation system of the United States, is untenable. Our adoption of such a policy would certainly not be consistent with a sound development of air transportation, and would not be conducive to the best interests of the foreign and domestic commerce of the United States, the Postal Service, and the national defense."

¹⁸ Civil Aeronautics Act, sec. 401 (e). See Appendix A.

to the opinion that the "present" number of carriers in air transportation was sufficient to protect against monopoly and that any future expansion of the industry would best be accomplished by the certification of presently operating air carriers except under "peculiar circumstances."¹⁹ This ruling froze the air transportation industry of the United States in the hands of the carriers existing at the time the Civil Aeronautics Act of 1938 was passed. It was practically a denial that one of the act's purposes had been to introduce new ventures and virtually held that, unless there was a definite reason for refusing to certificate an existing carrier for a given new route, the existing carrier would be preferred over a new company.

Since the close of World War II, the Board has taken a more liberal attitude and has found several instances where the "peculiar circumstances" would warrant issuing temporary or experimental certificates²⁰ of convenience and necessity to new companies. The best publicized of these instances was the certification of what were then known as "feeder" airlines but have since become known as "local-service" airlines. The limited traffic potentialities at most of the points on such routes, the Board felt, required an unusual effort in business development. It also thought that a greater effort in traffic development and exercise of managerial ingenuity might be expected from an independent local operator, whose continuation in the air transportation business would depend on the successful development of such traffic and the operation of his routes on a different basis than

¹⁹ *Delta Air Corporation et al.*, 2 CAB 447 (1941). In this decision the Board stated that "the number of air carriers now operating appears sufficient to insure against monopoly in respect to the average new route case, and we believe that the present domestic air transportation system can by proper supervision be integrated and expanded in a manner that will in general afford the competition necessary for the development of that system in the manner contemplated by the act. In the absence of peculiar circumstances presenting an affirmative reason for a new carrier there appears to be no inherent desirability of increasing the present number of carriers merely for the purpose of numerically enlarging the industry." In view of this later decision, it appears that the Board considered the American Export and All American decisions in the category of "peculiar circumstances." Competent new concerns had to be certificated in these instances since existing airlines were not then in a position to oppose Pan American Airways, in the one instance, or to develop new devices and techniques similar to the pickup mechanism, in the other case.

²⁰ Temporary certificates have usually been issued for from three to five years, and some of them have already been extended and doubtless will continue to be extended until the time when they are made permanent. The longer a temporary certificate stays in effect, the greater the chances that vested interests in the operation concerned will eventually prevail upon the Board to obtain permanent certification. See, for example, *Pioneer Air Lines Amendment*, 7 CAB 469 (1946); *Pioneer Certificate Renewal Case*, CAB Docket No. 3719 *et al.* (1950); *Trans-Texas Certificate Renewal Case*, CAB Docket No. 3720 *et al.* (1951); *Central Renewal Proceeding*, CAB Docket No. 4083 *et al.* (1953); *Ozark Renewal Proceedings*, CAB Docket No. 5988 *et al.* (1954).

the usual trunk airline operation.²¹ In most of the local-service cases, although existing airlines sought feeder routes in nearly every one, new operators were selected.²² The Board said of its feeder experiment that it "was definitely convinced that such services, if they are to be provided at all, would require specialized planning, specialized equipment, and specialized operators focusing on the development of the local transport market."²³ The first departure from this policy was

²¹ *Rocky Mountain States Air Service*, 6 CAB 695 (1946); "in view of the limited traffic potentialities of the points on the new system, an unusual effort will be required to develop the maximum traffic. Greater effort and the exercise of managerial ingenuity may be expected from an independent local operator whose continuation in the air transportation business will depend upon the successful development of traffic on the routes and the operation of the service on an adequate and economical basis." *Florida Case*, 6 CAB 765 (1946); here the Board took notice of the skepticism of an established carrier seeking the local-service route as to the success of the experiment. *West Coast Case*, 6 CAB 961 (1946); here the Board pointed out that the luxuries of the conventional-type service must be avoided if local-service routes are to succeed. *New England Case*, 7 CAB 27 (1946); in this case, although the application of the established carrier for some local-service routes was denied on the basis of the reasoning in the *Rocky Mountain Case*, the Board found reasons to grant that same carrier a number of small points, service to and from which would hardly be distinguishable from local-carrier service. *Texas-Oklahoma Case*, 7 CAB 481 (1946); in this case several of the new companies applying for local-service routes were "sponsored" by one of the established carriers operating in the area; and, in denying their applications, that fact was mentioned, the Board holding that a local-service operation by a trunk carrier might interfere with the trunk service. *South-eastern States Case*, 7 CAB 863 (1947); in this case a member of the Board dissented from the refusal to certificate local-service routes to established carriers, arguing that the local-service experiment should include one where the service was provided by established carriers.

²² In the *Great Lakes Area Case*, 8 CAB 360 (1947), Transcontinental and Western Air was authorized to serve, for three years, a large number of relatively small points, relatively close together, and United Air Lines was permitted to add one relatively small point to one of its routes for a similar length of time. The Board said, of T.W.A., that this will afford an opportunity to "experiment with short-haul services by one of the existing trunk carriers." It likewise held of the certification of United that it was for the same reason and that, therefore, no local-service carrier would be certificated in the particular region involved and that after the experimental period the results could be assessed along with the feeder experiment. Two members of the Board insisted, however, that the certification of T.W.A. was not at all an experiment in having a trunk carrier provide short-haul service but amounted to simply putting "local" points on a trunk route, which has often been done. In any case, it seems ridiculous to term certification of one point to United as a part of the feeder experiment, and the Board made no special provision of cost reporting or otherwise as a means of assessing the alleged experiment. Nor was T.W.A. or United prevented from serving the points in question just as they would serve any other point; in other words, service was not required to be "local" or "feeder" in nature. In the *Parks Investigation Case*, CAB Docket No. 3965 *et al.* (1950), involving the distribution of various routes of a certificated local-service line which had not yet begun to operate, the Board granted one route to Mid-Continent Airlines. The Board was "reluctant" to extend one of the local-service applicants for this route to the west of Chicago and this "coupled with the urgent requirements of the public interest for prompt inauguration of service" resulted in "an unusual situation and special circumstances that, in this particular instance, override the Board's policy against operation of feeder routes by trunk lines. . . ."

²³ Statement of the Civil Aeronautics Board before the President's Air Policy Commission, October 27, 1947, *Survival in the Air Age* (Washington, D.C.: U.S. Government

not until 1954, when the Board permitted Continental Air Lines to merge with a local-service carrier, Pioneer Air Lines.

In several less publicized instances, the Board also granted temporary certificates to new companies. One involved suburban commuting service between New York City and nearby cities without authority to carry mail; in this case the new company was the only applicant.²⁴ Another involved an experimental helicopter service within the Los Angeles area proposed by two applicants, one of whom was not engaged in air transportation but the other of whom had recently been granted a certificate for a feeder service. The application of the one not already certificated for air transport service was granted.²⁵ Still another instance involved an application by two new companies to operate all-expense conducted air tours, carrying passengers and their belongings only, between a large number of cities and many points of tourist attraction within and beyond the continental limits of the United States. The Board first denied both applications but later, upon instructions of the President of the United States,²⁶ certificated one applicant, Resort Airlines, to engage in foreign and overseas air transportation for an experimental period of five years only.²⁷

Another important approval of new air transport operators came in 1949, when the Board certificated four new companies to engage in the transportation of air cargo only for a period of five years.²⁸ The

Printing Office, 1948). For examples of the Board's reasoning in awarding a local-service route to a trunk line, see *Parks Investigation Case*, 11 CAB 779 (1950) and *Continental-Pioneer Case*, CAB Docket No. 6457 *et al.* (1954).

²⁴ *Air Commuting, New York City Area Service*, 8 CAB 1 (1947). The Board said: "It is of considerable public interest that new types of scheduled air transportation be fostered when circumstances portend economic success." Of course, an existing company could provide a new type of service.

²⁵ *Los Angeles Helicopter Case*, 8 CAB 92 (1947). The Board said that the fact that one applicant was already a certificated carrier was "not a controlling factor in its favor" because of the great difference between its feeder operations and the proposed helicopter service, which would be very complex. It was felt that two such different and important experiments as a feeder service and a helicopter service would not be developed to the maximum if undertaken by one management and that the new company would specialize on the helicopter service "with undivided attention."

²⁶ The Civil Aeronautics Act, sec. 801, provides that the issuance or amendment of a certificate involving foreign or overseas routes shall be subject to the approval of the President.

²⁷ *Skycruise Case*, 10 CAB 393 (1949). The Board limited Resort's operations strictly as follows: (a) "the holder shall offer, sell or furnish the aforesaid transportation only as a part of an all-expense escorted tour including cost of hotel and other accommodations, meals, and local side trips; no authority is hereby granted to offer, sell or furnish said transportation alone." (b) "the holder shall offer and sell only round trip authorization, and shall accept traffic for transportation only at co-terminal points."

²⁸ *Air Freight Case*, 10 CAB 572 (1949).

background of this case is significant, since it shows how the Board was placed, by a combination of its own prior actions and other circumstances, in a position where it was forced into a liberalization of its attitude toward the entry of new companies into air transportation.

At the time the Civil Aeronautics Act was adopted, there were a number of operators who had engaged in transporting passengers on a charter basis, not over fixed routes but usually from a fixed base. There was doubt at that time whether these operators were common carriers. Therefore, shortly after the passage of the act the Board sought to avoid the issue, or at least to postpone it, by exempting persons engaged exclusively in nonscheduled operations from the economic regulating provisions.²⁹ This was a perfectly logical thing to do because, in 1938, it would have been more trouble than it was worth to have attempted to distinguish between those nonscheduled operators who were common carriers and those who were not. (See Chapter 3.)

With the close of World War II a different situation developed than had ever existed before in air transportation. During 1945 and 1946 hundreds of operators of aircraft sprang up. This was due partly to overenthusiasm in the belief that the air age "had arrived" and partly to the stimulating effect of the combination of relatively cheap surplus aircraft and the many trained pilots and others who had been associated with aviation during the war. At this time, also, the established air carriers were unable to handle all the passengers or cargo traffic offered them because of their still curtailed capacity. The Board's early nonscheduled exemption from the economic regulations imposed by the act became, therefore, the excuse for hundreds of new air transport ventures.

The situation finally got so far out of hand that the Board took action and issued orders to "cease and desist" in several cases where the nonscheduled nature of the operations was nominal rather than real.³⁰ In the meantime, however, certain operators had developed a considerable business on an exclusive cargo basis. The Board took no action against any all-cargo operators, even though, in a number of cases, it is difficult to see how their operations could have been classified as nonscheduled or how they could have been regarded solely as contract operators, who are not subject to economic regulation under

²⁹ Civil Aeronautics Act, sec. 416(b). See Appendix A.

³⁰ See, for example, *Page Airways Investigation*, 6 CAB 1061 (1946); *Trans-Marine Airlines Investigation*, 6 CAB 1071 (1946); *Investigation of Nonscheduled Air Services*, 6 CAB 1049 (1946). See Chapter 3.

the Civil Aeronautics Act of 1938. In at least one case where an operator of all-cargo planes also did a passenger business, the Board issued an order requiring the operator to cease and desist in its passenger service and its combination passenger and cargo service, but deferred any decision on its all-cargo service.³¹

Most of the air cargo operators had made application for certificates of convenience and necessity, which had been consolidated into one case, the Air Freight Case, heard in 1946; but, pending decision, the Board permitted these operators to continue on a full-fledged scheduled basis³² for about three years. Then in 1949 the Board certificated, for a temporary period of five years, four of the new companies: The Flying Tiger Line, Slick Airways, U.S. Airlines, and Airnews, all of which had previously been operating at one time or another, first under the Board exemption as nonscheduled carriers and then under the special exemption mentioned above. In 1950, another carrier, Riddle Aviation Company was granted a certificate for service between New York, Miami, and international points, chiefly Puerto Rico. In 1951, the Airnews certificate was suspended for noncompliance with its provisions.

In issuing these temporary certificates, the Board for the first time characterized such an action as "promotional," in accordance with the responsibility vested in it by Congress to encourage and develop a national system of air transportation.³³ It also pointed out that the authorization of all-cargo carriers would not, in their opinion, adversely affect the competitive balance existing between all-cargo car-

³¹ *Willis Air Service, Non-certificated Operations*, CAB Docket No. 2639 (1947).

³² CAB Economic Regulations, sec. 292.5.

³³ "In view of the contention which has been advanced that the factual evidence of record is not sufficiently substantial to justify the certification of any all-cargo carriers, it is essential in disposing of the present case that we keep in mind the nature of the basic issue involved. That issue is primarily promotional in character and relates to developmental rather than purely regulatory purposes. This characteristic of the statutory scheme serves to distinguish the Civil Aeronautics Board from judicial tribunals and even from many regulatory bodies. Thus the Civil Aeronautics Board, in addition to regulatory functions which are concerned with the protection of the users of a public service, has been entrusted by Congress with a major promotional and developmental responsibility—the encouragement and development of a national system of air transportation . . . Throughout the text of the Civil Aeronautics Act runs the unmistakable thread of this developmental objective. The Board is directed 'to consider as being in the public interest and in accordance with public convenience and necessity the encouragement and development' of the national (air) transportation system. . . . It is to fix mail rates, not in accordance with the orthodox standards of fair and reasonable compensation for service performed, but with due regard to the financial need of the carrier . . . Thus the Civil Aeronautics Act is not designed wholly as a code for the adjustment of conflicting private rights through adjudications, but expresses the desire of Congress, through administrative control, to encourage and guide the development of a dynamic industry vitally related to the national interest" (*Air Freight Case*, 10 CAB 572 (1949)).

riers and the then-certificated airlines; but, on the other hand, it said that the cargo carriers would provide a valuable yardstick for measuring the alertness and efficiency of other carriers of cargo.⁵⁴

Restrictions of entry into the air transportation industry must be handled with great care, for some of the same factors that encourage new concerns to enter the business also tend, if these new entrants are denied, to check the effective development of the existing market potential by the airlines already in operation. Future efforts to expand domestic air traffic of both passengers and cargo must be directed toward reducing the difference in rates between air and surface carriers through reduced costs of producing air transportation. Without the competitive force provided by new entrants, existing airlines are less likely to develop their present routes to the fullest extent.

Most airline costs, as those for labor, equipment, and many airport charges, are the same for all operators. Unions have standardized rates of pay, except where regional differences are important. Modern aircraft, necessary for the best of service, are available to all airlines; airports have been made freely accessible at reasonable fees in order to attract air carriers and to stimulate business. Insulated against outside stimulus, competitive forces within the industry are diverted to the level of furnishing "service."

More new entrants into the air transportation industry could have supplied the competitive incentive which the Board has seemed so anxious to achieve. Until recently, however, Board policy has been to restrict entry and to rely on the airlines already operating to supply the necessary competitive incentive. Air mail subsidies have been employed to counteract the unfavorable economic trend of the industry; and the result has been a reduced emphasis on control of the sizable variable costs, which would have been the most direct approach to lower rates. Thus, while publicly stating that economic regulation alone is incapable⁵⁵ of supplying the incentive required for

⁵⁴ "The certification of unsubsidized all-cargo carriers will require such carriers to bend all their efforts and to direct their abilities and skill to the full development of the air freight potential. Such carriers will not be able to rely on passenger operations or mail payments to furnish the greater portion of their revenues. They will live and prosper only through their ability to develop an economic business and to constant search for new techniques, new business and new equipment. To the extent that they succeed in their endeavors they will, by their example, benefit the presently certificated carriers and air transportation as a whole . . . Thus, the cargo carriers will provide a valuable yardstick for measuring the alertness and efficiency of other carriers of cargo." (*Ibid.*)

⁵⁵ "Thus, economic regulation alone may not be relied on to take the place of the stimulus which competition provides to the advancement of technique and service in air transportation. Competition invites comparisons as to equipment, costs, personnel, methods of operation, solicitation of traffic, . . . all of which tend to assure the development

the development of air transportation, the Board has been forced by its own policy of restricted entry to rely on administrative techniques in an effort to achieve the goal of better service at lower rates.

Entry of Surface Carriers into Air Transportation

The Board has followed the policy of prohibiting the entry of railroads, motor carriers, and steamship operators into air transportation. In so doing it has made use of a very rigid construction of a provision of the Act of 1938 which prohibits a surface carrier from "merging with or acquiring" an existing air carrier unless such surface carrier "could employ aircraft to public advantage in its operation."³⁶

Relying on a supposed intent of Congress to maintain independence between the various modes of transportation,³⁷ the Board has interpreted section 408(b) of the Civil Aeronautics Act to mean that a surface carrier could only acquire an air carrier whose operations were "incidental to the surface operations."³⁸ Although the prohibition in the statute was concerned with mergers and sales, the Board has extended this additional "incidental" criterion to restrict surface carriers seeking to enter air transportation either directly by applying for a certificate or indirectly by organizing a subsidiary.³⁹ The

of" the desired system. See *American Export Airlines, Trans-Atlantic Service*, 2 CAB 16 (1940).

³⁶ Civil Aeronautics Act, sec. 408(b). The Board itself has characterized its interpretation as "rigid." See *American Export Lines, Control American Export Airlines*, 4 CAB 104 (1943).

³⁷ This interpretation is based on a review of a series of Congressional enactments. The Board contends that as early as 1912 Congress announced a policy of independence of water carriers from railroads in the Panama Canal Act of that year. In 1935 there was incorporated into the Motor Carrier Act a similar restrictive provision in Section 213 which was the basis for section 408(b) of the Civil Aeronautics Act. Further, Congress affirmed this policy by incorporating into the Transportation Act of 1940 the provisions of the Panama Canal Act and of section 213 of the Motor Carrier Act. See "Civil Aeronautics Board Policy—An Evaluation," *Yale Law Journal*, April, 1948.

³⁸ *American Export Lines, Control American Export Airlines*, 3 CAB 619 (1942), 4 CAB 104 (1943); *Acquisition of TACA, S.A. by American Export Airlines*, 3 CAB 216 (1941).

³⁹ The Board's original view was that the statutory prohibition was solely against acquisition of an operating airline by a surface carrier and did not prevent a surface carrier from organizing a subsidiary to become an air carrier (*American Export Airlines, Inc., Certificate*, 2 CAB 16 [1940]). Pan American, as an intervenor, however, carried the case to the federal courts, where the Circuit Court of Appeals for the Second Circuit in dictum stated that the Civil Aeronautics Board should consider the prohibition even in granting new certificates (*Pan American v. Civil Aeronautics Board*, 121 Fed. [2d] 810 [C.C.A. 2d, 1941]). Thereupon, the Board required the American Export Steamship Line to divest itself of control of the air carrier which had been granted a certificate as a subsidiary of the steamship company (*American Export Airlines*, 3 CAB 619 [1942], 4 CAB 104 [1943]).

Board has voiced the opinion that this is a valid interpretation of legislative intent; but in all cases so far, when actually faced with a surface carrier's application, it has usually denied the application on the less controversial ground that some other applicant is better fitted to service the particular route or that the particular air transportation is not warranted by the public interest.⁴⁰

The basis of the Board's specialized treatment of surface carriers was subjected to re-examination under pressure from the steamship companies in 1947, in hearings on several bills which were introduced in the first Session of the 80th Congress and intended to amend and clarify the Civil Aeronautics Act on this point, and likewise in testimony before the President's Air Policy Commission.⁴¹ Altering its position slightly, the Board conceded that Congress, while not making mandatory the application of the "incidental to surface operation" test in a situation where the surface carrier was requesting a certificate directly or indirectly, had at least enunciated the criterion as an additional guide to be considered in an evaluation of the "public interest" in the proposed operation. Despite this rather dubious distinction, it seems clear that the Board will continue to consider the "incidental" test as determinative. The result is virtually a total ban on surface-carrier entry into air transportation, although legislative history does not necessarily dictate such a stand.⁴² It would seem to be a sounder course for the Board to disregard the "incidental" test as now applied and to consider each individual application on its merits, treating the fact that an applicant is a surface carrier merely as one element of convenience and necessity in a par-

⁴⁰ See *Braniff Airways, Kansas City-New Orleans Service*, 2 CAB 727 (1941); *North-east Airlines, North Atlantic Routes*, 6 CAB 319 (1945); *Rocky Mountain Air Service*, 6 CAB 695 (1946); *Latin American Air Service*, 6 CAB 657 (1946); *Hawaiian Case*, 7 CAB 83 (1946). In *Great Lakes Area Case*, 8 CAB 360 (1947), a surface motor carrier running a limousine taxi service in Cleveland, Ohio, was authorized to conduct an experimental helicopter service, which never went into operation, between the Cleveland airport and points in the municipal area, without mail pay, for three years. It was the only applicant for the service. This decision is of such limited significance and rests on such peculiar circumstances that it is hardly an exception to the Board's policy.

⁴¹ See *Hearings before Committee on Interstate and Foreign Commerce on Bills Relating to Overseas Air Transportation (80th Cong., 1st sess.)* (Washington, D.C.: U.S. Government Printing Office, 1947). The President's Air Policy Commission stated that surface carriers "should not be automatically prevented from such action (control of air carriers) simply on the grounds that they are surface carriers—as now appears from the record to be the case" (*Survival in the Air Age* [Washington, D.C.: U.S. Government Printing Office, 1948]).

⁴² The legislative history is exhaustively reviewed in the concurring opinion of James M. Landis, then Chairman of the Board, in *American President Lines, Ltd.*, 7 CAB 799 (1947). See also *Hearings before Committee on Interstate and Foreign Commerce on Bills Relating to Overseas Air Transportation (80th Cong., 1st sess.)* (1947).

ticular case. Protection would be provided against any prospective monopoly by recourse to the "competition to the extent necessary" provision of the act involved in a consideration of the public interest. Certainly, the Board by pursuing its arbitrary policy has barred a whole segment of trained capital from possible entry into air transportation and to this extent has restricted competitive forces. Needless to say, the certificated carriers agree with the Board's stand.

Entry of Freight Forwarders

Another phase of the problem of new companies entering air transportation in connection with air freight is the Board's policy toward freight forwarders, who have long been recognized by ground carriers as valuable middlemen between shippers and carriers. In 1942, the Board held that a forwarder shipping by air is an "indirect" air carrier within the meaning of the Civil Aeronautics Act,⁴³ even though he operates no aircraft and does not carry anything. Rather, forwarders arrange transportation of goods for other people who are the individuals interested in getting shipments to destination. Only one indirect carrier of the forwarder type was then permitted to operate, the Railway Express Agency, but was not required to obtain a certificate.⁴⁴ Because of their characterization, in 1942, as "indirect air carriers" forwarders have sometimes claimed preferential treatment as carriers from the airlines—the "direct air carriers." The Board has,

⁴³ Civil Aeronautics Act, sec. 1 (3): "'Air carrier' means any citizen of the United States who undertakes, whether directly or indirectly or by a lease or any other arrangements, to engage in air transportation." Section 296.1 of the Board's Economic Regulations defines an air freight forwarder as "any person . . . which in the ordinary and usual course of his undertaking, (a) assembles and consolidates or provides for assembling and consolidating . . . and performs or provides for the performance of break-bulk and distributing operations . . . (b) assumes responsibility for the transportation of such property . . . and (c) utilizes . . . the services of a direct air carrier. . . ."

⁴⁴ *Railway Express Agency, Inc., Certificate of Public Convenience and Necessity*, 2 CAB 531 (1941). The Board held that the Railway Express Agency was an "air carrier" and thereby required to obtain a certificate prior to operation but that it was not entitled to a "grandfather" certificate since that provision (Civil Aeronautics Act, section 4 [e]) only pertained to those concerns that physically operated aircraft. By this decision the Board secured control over forwarders in air transportation without committing itself to a definite stand on the status of the Railway Express Agency; and any attempt by the Interstate Commerce Commission to extend its jurisdiction over air forwarding because of the railroad ownership of Railway Express Agency was forestalled. The Board then exempted the Railway Express Agency from the necessity of obtaining a certificate. In 1942, another concern contended it was a shipper, utilizing the services of Railway Express Agency, and not an "air carrier." The Board answered this claim in the negative; refused an exemption similar to that accorded Railway Express Agency; and issued a cease and desist order (*Universal Air Freight Corp., Investigation of Forwarding Activities*, 3 CAB 698 [1942]).

however, clearly indicated that so far as the direct air carriers are concerned, the forwarder has the status of a shipper.⁴⁵

After the close of World War II and the start of air freight operations by the irregular or noncertificated carriers, the Board received many applications from concerns anxious to enter the field of air freight forwarding. After some five years, during which the Board investigated the whole subject of indirect air services in the transportation of property, it permitted air freight forwarders to enter domestic air transportation on a temporary five-year basis in August, 1949. Then, in September, 1949, the Board permitted freight forwarders to engage in overseas and foreign air transportation in the same manner, as they were already a part of domestic air transportation.⁴⁶ The reasons the Board gave in authorizing air freight forwarder operations were to make possible improved service to the shipping public and to generate additional freight traffic for the direct air carriers.

No limit was set by the Board as to the number of forwarders who might engage in handling air freight. They were exempted from the necessity of obtaining certificates of convenience and necessity, and there was no limit to the number of points an individual forwarder might serve. All that was required was for a forwarder already in existence or one desiring to enter the business to file an application for a letter of registration along with a tariff setting forth all points between which, and the rates at which, air freight would be transported. Since many forwarders contemplating the handling of air freight were already in the business of handling shipments by surface transportation, the question arose as to whether their authorization would be in conflict with the Board policy of keeping air and ground transportation strictly separated. The Board decided that the conduct of freight forwarding operations by air by the same companies that

⁴⁵ *Air Freight Forwarder Case*, 9 CAB 473 (1948). The Supreme Court upheld this as in regard to surface forwarders in *Interstate Commerce Commission v. Delaware, Lackawanna and Western Ry.*, 220 U.S. 235 (1911); *United States v. Trucking Co.*, 310 U.S. 344 (1940); *Chicago, Milwaukee, St. Paul & Pacific R. Co., v. Acme Fast Freight*, 336 U.S. 465 (1949). In the latter case the court considered whether passage of the Freight Forwarder Act in 1942 had changed the traditional relationship between a forwarder and a railroad from that of shipper and carrier, and the decision of the court was that it had not. This decision has not been changed by a 1950 amendment to sec. 402 (a) (5) of the Interstate Commerce Act, which added to the definition of a freight forwarder the concept of common carriage. There is nothing inconsistent between a freight forwarder being held to the obligations of a common carrier as regards its shippers and being classified as a shipper as regards the direct carrier.

⁴⁶ *Air Freight Forwarder Case (International)*, 11 CAB 182 (1949).

handled surface shipments would not be contrary to previous policy or inconsistent with the public interest except in the case of those forwarders controlled by railroads, where it was felt that such control might create a conflict of interest between the air and rail operations of the parent company which would prove detrimental to the full development of the air service. All applications by railroad-controlled organizations for registration as air freight forwarders were therefore denied.⁴⁷

The authorization of air freight forwarders was unanimously opposed by the airlines engaged in carrying passengers, mail, express, and freight. It was favored by those companies engaged solely in air cargo operations. The combination carriers, operating only a few all-cargo aircraft and faced with the necessity of continuing to handle relatively small-sized shipments in most of their aircraft, contended that the operations of forwarders would slow down air freight transportation and thus tend to destroy its greatest advantage—speed. This would be made so by the very nature of the forwarding business, which is dependent upon holding small shipments for consolidation into larger ones. It was also claimed that such consolidations would limit the utility of cargo space on airline passenger schedules; reduce carrier revenues without materially reducing costs; and make it more difficult to reduce freight rates, particularly on large-quantity shipments, because of the forwarders' desire to have the spread between small- and large-shipment rates maintained, which is the basis on which their income depends. The strictly air cargo operators, working without the traffic solicitation organization of the established airlines, were greatly in favor of the forwarders, since they offered such operators a ready-made sales force as well as a source of traffic in airplane loads which they could well handle in their exclusive cargo aircraft.

In deciding the freight forwarder question as it did, the Board ignored an opportunity to profit from the experience in other fields of transportation. Freight forwarders, who have become important middlemen in the surface transportation field, developed only because the railroads failed to provide a satisfactory service for handling less-than-carload shipments.⁴⁸ The railroads never seemed willing to do

⁴⁷ *Air Freight Forwarder Case*, 9 CAB 473 (1948). The principles which motivated the Board in excluding railroad controlled forwarders from air freight forwarding were upheld in *National Air Freight Forwarding Corp. v. Civil Aeronautics Board*, 197 F. 2d 384 (1952).

⁴⁸ In *Freight Forwarding Investigation*, 229 ICC 201 (1938), the Interstate Commerce Commission found that there was no need for forwarder services if the railroads would organize for the purpose of setting up an efficient system to take care of less-than-carload business.

this despite numerous recommendations that they do so, with the result that the forwarders grew powerful and it became necessary to provide for their regulation in the passage of Part IV of the Interstate Commerce Act in 1940. The lack of interest by the railroads in handling small shipments themselves is understandable, since such shipments amount to about 2 per cent of their business and have never been considered profitable by most railroads.

Early in 1953, the Board instituted a proceeding⁴⁹ to determine future policy in regard to air freight forwarders. The occasion for this was the impending expiration of all the letters of registration issued under Part 296 of the Board's Economic Regulations, under which they had been operating since 1948. In the light of developments since 1948, particularly the entry of shippers' associations into air transportation (see Chapter 7), the scope of the investigation was expanded to include a general investigation of all indirect carriers of property, including the Railway Express Agency.

Freight forwarding by air has not developed to the extent hoped for in 1949. Almost none of the conditions making forwarding by rail such an important business have been present in air transportation. Less-than-plane-load traffic accounts for nearly all the air freight business and airlines have been both willing and anxious to handle the business without the use of middlemen. They have, in fact, been successful in securing the approval in their tariffs of "assembly" rules, which permit the consolidation of small shipments over a period of time for movement to a single consignee at one destination, as well as "distribution" rules, which permit a shipment consisting of parts ultimately destined to be delivered as part shipments, to move as a unit to destination and there be broken for distribution of the several parts. (See Chapter 9.) There have been several other reasons why air freight forwarding has not become as important as many expected it would: (a) The airlines have not furnished the necessary aircraft to develop volume, since it has been more profitable to carry passengers than freight, and freight planes have in some instances been transformed to passenger aircraft; (b) the military need for aircraft in the Korean air-contract service took many from the airlines which might otherwise, in the several years of that conflict, have been made available to forwarders in this country; (c) freight forwarders themselves have not been able to develop the volume of domestic traffic anticipated, though they have been quite successful in foreign trade; and (d) freight forwarding has not been profitable since the

⁴⁹ *Air Freight Forwarder Investigation*, CAB Order No. E-7141, February 4, 1953. See also CAB Docket No. 5947 *et al.* (1954).

spread between large and small shipments, upon which forwarders operate in other fields of transportation, has not been great.⁵⁰

Of the 57 air freight forwarders originally authorized in 1949, only 12 had operated prior to July 1, 1953 and three of these did not operate in the first six months of 1953. Forwarders authorized since the *Air Freight Forwarder Case* were, however, more active; of the 27 authorized, 21 had operated prior to July 1, 1953, and 16 were still operating in the first six months of 1953.

The future seems to promise some improvement in the conditions which have handicapped the development of air freight forwarding. For one thing, additional all-freight equipment is under purchase by the transcontinental carriers. Secondly, it has been forecast⁵¹ that by 1960, ton-miles of air freight will reach 600 million, as compared to the 276 million in 1953, without assuming any substantial change in rate levels or type of equipment to be operated by the air carriers. The increased volume is expected to result from the requirements of an expanding economy for air freight service, diversion of traffic now moving by rail express and motor truck, extension of air freight service to additional communities, improvement in the competitive status of air freight if surface rates continue to rise faster than air, improvement in ground handling techniques, the creation of a certain amount of new traffic by extension of market areas, increased selling effort on the part of the air carriers, and improvements in the packaging and handling of commodities requiring controlled temperatures. (See Chapters 15 and 16.)

⁵⁰ A rate spread may be defined loosely as the difference between the rate charged by the forwarder and the rate which it pays the direct air carrier. This spread can be increased either by an increase in the forwarder rate or a decrease in the direct carrier rate. The rate charged by the direct air carrier is not within the control of the forwarder. The forwarder is, therefore, left with no alternative other than to operate under the spread which it creates when it establishes its own rates.

⁵¹ Forecast of 1960 *Domestic Air Freight Traffic* prepared by the Office of Program Coordination of the Civil Aeronautics Administration, 1954, pp. 14-15.

Chapter

7 * CIVIL AERONAUTICS BOARD POLICY— COMPETITION (Continued)

THE Civil Aeronautics Board has for the most part followed its “balanced competition” theory as new routes and extensions to old routes have been certificated. The authority to award certificates of convenience and necessity for new service and to extend existing routes provided the Board with the means for altering the “grandfather” route pattern in the interests of efficient service and also for developing competition within the industry so as to approach the avowed goal of strengthening the smaller airlines.

Awarding New Routes

As indicated in the previous chapter, the Board at first maintained that competition between airlines was not made mandatory by the Civil Aeronautics Act but, on the other hand, was a matter of administrative discretion dependent on the facts of any particular case.¹ It therefore permitted the then-existing carriers to compete between major air terminals—first, over different intermediate routes and, later, on a point-to-point basis. Ultimately, the Board took action to develop competition on all routes which, in its opinion, exhibited two-carrier traffic potential, unless it could be shown that the service of the second airline could not be integrated into an economically self-sustaining system or that there would be undue diversion of revenue from existing carriers.² The Board today holds this competi-

¹ *American Export Airlines, Trans-Atlantic Service*, 2 CAB 16 (1940).

² The Board possesses wide authority under the provisions of the act (sec. 2[b] providing for “competition to the extent necessary” to prescribe the amount of competition according to its own ideas. In various cases it has shown: (1) the incentive of competition is necessary to assure the full development of air transportation; (2) it is immaterial that a carrier can, or will, render adequate service; (3) a carrier’s failure to provide adequate service is evidence of a need for competition; and (4) there is a presumption in

tion justifiable on the grounds that it assures incentive to the carriers; it does not depend on the inability or unwillingness of any existing carrier to furnish additional service in any particular case.

As a result of its new route policy, Board action has enlarged the original "grandfather" route systems. Additional certification has multiplied route mileage, the award usually being based on a study of numerous criteria indicating possible national or local need for a particular service.³ Further, the Board has adjusted routes in accordance with technological progress in airline operating performance when, because of the long-range flight potentialities of modern aircraft, it has granted permission to consolidate routes and to fly non-stop schedules over the resultant single route,⁴ even where this has resulted in a diversion of traffic from other airlines. Effective action in supervising the over-all route pattern has, however, been handicapped by a lack of authority to revoke or order a transfer of the certificate or routes of any airline which holds permanent certificates of public convenience and necessity for such routes, even though the Board may consider such a revocation or transfer to be in the public interest.⁵

favor of competition on any route having sufficient traffic to support competing services without unreasonable increase in operating costs. See *Transcontinental and Western Air, Additional North-South California Services, Supplemental Opinion*, 4 CAB 373 (1943); *Atlantic Seaboard Operation, Supplemental Opinion*, 4 CAB 55 (1944); *West Coast Case*, 6 CAB 961 (1946); *Northeast Airlines, Boston Service*, 4 CAB 686 (1944); *Northeast Airlines, North Atlantic Route Case*, 6 CAB 319 (1945); *Trans-Pacific Airlines, Ltd.*, CAB Docket No. 5366 (1951).

³ See "Certificates of Public Convenience and Necessity," *Aereports*, September, 1947; *Northwest Airlines, Duluth-Twin Cities Operation*, 1 CAA 573 (1940); *Transcontinental and Western Air, North-South California*, 4 CAB 254 (1943). The Board publishes the results of many surveys of market data. See CAB, *Origin and Destination of Airline Traffic* (1940); CAB, *Annual Statistics Domestic Carriers*; CAB, *Airline Traffic Survey*, for various years; CAB, *Economic Characteristics of Urban Points Not Certificated for Air Service as of April 1945* (1946).

⁴ *American Airlines, Nonstop Services*, 7 CAB 13 (1946); *American Airlines, Consolidation of Routes*, 7 CAB 337 (1946); *Northwest Airlines, Consolidation of Routes*, 7 CAB 199 (1946). The routes over which the trunk airlines were certificated in the original "grandfather" cases stemmed from the air mail contract routes originally awarded by the Post Office Department and followed the civil airways between designated points. These routes were predicated upon the use of twin-engined aircraft with an economic range of about 400 miles. The economic range of the four-engined aircraft which came into use in 1946 was at least 1,000 miles. Accordingly, it became operationally feasible to meet the demand for faster service by gradually obliterating the arbitrary course of the original routes, so as to permit direct flights between important points. The airline map, therefore, must now be read along with airline timetables in order to understand the actual flight pattern.

⁵ Civil Aeronautics Act, sec. 401 (h), empowers the Board to "alter, amend, modify or suspend" a certificate "if public convenience and necessity require"; but it specifically limits revocation to cases of ". . . intentional failure to comply with any provision of Title IV of the Act . . . or any order, rule or regulation issued thereunder, or any term,

The Board's power to revoke permanent route certificates has never been tested; but it is certain that considerable legal wrangling will accompany any attempt to revise the airline route structure in this manner, with the final adjudication determined by the courts or ultimately resolved by the Congress.

Smaller airlines have been strengthened by route additions and extensions, but at the same time the major carriers have also been enlarged through the granting of certificates which permit them to round out strong long-range domestic routes and to engage in trans-Pacific and trans-Atlantic service.⁶

Operational efficiency could not have been the determining factor in the awarding of the prime overseas routes to the larger airlines.

condition or limitation of such certificates." If there were any doubt as to the Board's inability to revoke a certificate, that doubt would be dispelled by the decision of the Supreme Court in *United States v. Seatrail Lines*, 329 U.S. 424 (1946), which held that certificates of public convenience and necessity cannot be revoked in the absence of statutory authority. See also *Smith Brothers, Revocation of Certificate*, 33 MCC 465, wherein the Interstate Commerce Commission held to the same opinion in dealing with a statutory provision substantially identical to sec. 401(h) of the Civil Aeronautics Act.

In 1947 the Board started investigations of several airlines to appraise their routes and to attempt to discover the cause of the financial crisis which each faced at that time. *Investigation of Chicago and Southern Air Lines, Inc.*, 9 CAB 827 (1947); *Investigation of Northeast Airlines, Inc.*, CAB Docket No. 2853 (1947); *Investigation of Western Air Lines, Inc.*, CAB Docket No. 2911 (1947); *Investigation of Colonial Airlines, Inc.*, 9 CAB 379 (1947); *Investigation of Capital Air Lines, Inc.*, 11 CAB 307 (1947). These inquiries were conducted under authority of sec. 205(a), 407(a), 415 and 1002(b) of the Civil Aeronautics Act of 1938.

In the latter part of 1948 and early part of 1949, the industry was disturbed by the issuance of what were termed "dismemberment" orders by the Board, under which it undertook to study National Airlines, Western Air Lines, and Northeast Airlines to discover whether some of their routes should not be transferred to other carriers or abandoned entirely. At the same time, the subject of mergers with other carriers, purchases, modifications, or interchange agreements were to be studied. See particularly *National Route Investigation*, 10 CAB 8 (1949) and *National Route Investigation*, CAB Docket No. 3500 *et al.* (1951). It was contended by the airlines that the Board had no authority to order any such transfers even if they should be found in the public interest. Such a contention has merit, particularly since the Board itself has stated "we know of no direct or indirect means available under existing law by which an air carrier can be forced against its will to transfer its property, business and certificate to another air carrier" (*United Air Lines, Inc., Acquisition of Air Carrier Property*, 8 CAB 298 [1947]).

By an order dated May 29, 1950, the Board found no further purpose in continuing the investigations of the finances, routes, and operations of Capital Airlines and Colonial Airlines. A report had already been submitted to the Board on Chicago and Southern Air Lines by the committee appointed to make the field study in 1947. The Northeast and Western cases were continued. (*Investigations of Finances, Routes and Operations of Capital Airlines, Inc., et al.*, 11 CAB 307 [1950]).

⁶ See *Northeast Airlines, North Atlantic Routes*, 6 CAB 319 (1945). Transcontinental airlines, possessing strong financial resources and profitable domestic routes, were apparently preferred for this overseas business because of Board concern over prospective severe competition from foreign government-controlled air carriers. In less lucrative markets, such as the Caribbean, smaller domestic airlines were permitted to share along with the major airlines if the additional service could be integrated into the existing system. See *Latin American Air Service*, 6 CAB 857 (1946).

since airlines with less domestic route mileage exhibit the same operating results as the major airlines when both employ the same type of aircraft. Because of this Board policy, the major airlines have been increased to a size more than large enough to utilize modern and efficient aircraft, whereas the small lines operate systems that in most instances are incapable of efficiently employing long-range aircraft, unless the lines are permitted to expand.

The impact of technological progress has added to the ill effects of the Board's regulatory policy in route awards. The ability to realize the economies of the new aircraft rests mainly with the major carriers, who possess sufficient capital resources and have the long-haul routes between important population centers with a traffic potential that will assure adequate loads. Increased flying range further strengthens the bargaining position of the larger airlines, since they alone can supply one-plane and one-carrier service between the important cities with a minimum of inconvenient connections. As a result, the smaller airlines, unless they can arrange interchange services, suffer a further loss of traffic and revenue from the connecting service, which they formerly furnished.

An obvious fault in the Board's new route policy is a procedural one which has resulted from its not taking the initiative in planning the airline route pattern. Rather, it has simply decided cases as they have come up, as carriers have filed applications for new routes or extensions, and as a general rule applications are handled in the order of their priority of filing.⁷ Furthermore, when the Board has

⁷ In the first case where the Board had to make a choice between carriers, it was met with the argument that the carrier first applying for a route should be preferred. This argument was dealt with in these words: "To award a certificate covering a particular route upon the basis of priority of application might result in an operation entirely contrary to the public interest" (*Continental Air Lines, Mandatory Route*, 1 CAA 88 [1939]). A little later the same argument met with this treatment: "... we believe that in no case can priority of application be conclusive unless all other considerations are equal" (*Braniff Airways, Houston-Memphis-Louisville Route*, 2 CAB 353 [1940]). But in the next new route case, where apparently the reasons for the choice of carrier were difficult for the Board to state, prior display of interest in the route in question seems to have had some weight (*Western Air Express, Great Lakes-Lethbridge Operation*, 2 CAB 425 [1940]). Finally, the Board chose between two applicants solely on the basis of priority of applications, saying: "... While priority of filing does not in itself constitute a basis for selecting one carrier over another, it is a factor which must be given weight when other considerations are equal, especially as in this case where interval between filings is almost 5 years" (*Rocky Mountain States Air Service*, 6 CAB 695 [1946]). Even so, the Board has been known to deny a given application on the ground that other applications for a similar service are pending, even though some of those were not filed until after the hearing on the denied application and though none of the pending applications had yet reached the stage of active consideration (*Texas-Oklahoma Case*, 7 CAB 481 [1946]). Also, it is not unusual for the Board to defer decision on a given application pending the presentation for decision of some other case, already heard, which includes related appli-

reached application X filed by airline A, airline B can file application Y and secure its consolidation for hearing with X. Airline B may be motivated by purely defensive considerations, or its application may be presented years before it would normally be filed because of the sudden opportunity to get a hearing. Finally, in acting upon each case, the Board is confined to the record of that case, must decide it upon its own facts, and theoretically is unable to take action which will take into account what may have to be done later in other new route cases involving, perhaps, the same airlines and related routes.

Under such a system there can be no long-range program of expansion for individual airlines or for the air transport system as a whole. Each case is presented as though the question were "Does the public immediately affected need this particular route?" This question does not present any adequate means for solving the problem of "What extensions of airline A are necessary to make it strong?" or "What extensions, if any, are desirable from the standpoint of the entire air transportation system?"

This difficulty is increased by the fact that the Board, in most cases, acts only upon evidence and arguments presented by the airlines. Public bodies, such as cities, also participate in some cases; but their viewpoint is restricted to their particular local interests. Thus, there is no national or over-all point of view presented to develop the relation of a particular case to the ultimate aim of a sound system of air transportation. The Board, however, created the function of the Public Counsel relatively early in its administration. Through him the over-all points of view presumably are to be presented in each new route case. But the end sought has not been effectively achieved, and the Public Counsel's participation in new route cases has become sharply curtailed to the point where he "is of no significance."⁸

Moreover, no statement of goals, supported by economic analysis taking the whole picture into account, prepares the Board to accomplish its task. Board action is not fitted into a plan. The destiny of a particular airline, presumably needing strength, is not defined in advance in relation to similar definitions of the destinies of other airlines, to guide decision. As a result, situations like the following have been created:

cations (*North Central Case*, 7 CAB 639 [1946]). Such deferments, it is said, prevent mere priority of filing or of hearing from being a determining factor (*New England Case*, *Supplemental Opinion*, 7 CAB 439 [1946]).

⁸ Howard C. Westwood, "Choice of the Air Carrier for New Air Transport Routes," *George Washington Law Review*, December, 1947, n. 312, p. 99.

1. The Board certificated a relatively weak airline along a route already served, perhaps inadequately, by a strong carrier. Faced with new competition, a stable volume of traffic, and excess capacity, the stronger of the two serves the competitive route with so many schedules that it is virtually impossible for the small carrier to operate enough schedules to attract traffic and at the same time have adequate load factors.

2. The Board extended a small airline over a short but dense route segment. This was done with the expectation that it would strengthen the carrier and make it more nearly self-sufficient. Actually, the short-haul nature of the operation virtually precluded a profitable operation for the weak carrier with its available equipment and with heavy terminal costs. If the small airline was not faced with heavy competition, it might conceivably have broken even on the route. If it was involved in heavy competition, it probably lost heavily.

3. An airline applied for and was awarded too many intermediate points on a route that was weak in terminal-to-terminal traffic. (This type of situation arose usually out of the desire of intermediate points for service. They brought pressure on the airline, which in turn vigorously pressed its application.) The total traffic on the route was not sufficient to warrant both nonstop service, which was required to attract traffic moving between the terminal, and local service, which would give adequate service to the intermediate points.

These are only a few examples, but they show how the Board's policy on route certification has resulted in the evolution of at least two weaknesses in our air transportation system: inherently weak routes and the integration of routes into weak systems. This, of course, is contrary to the intent of the Civil Aeronautics Act, which was designed to avoid such situations. The country had been through the same sort of development with the railroads, and these carriers are still handicapped by this problem. The powers given to the Board were, therefore, conferred with the aim of preventing in air transportation the very situation which has developed.

A partial cause of the Board's failure to prevent what has taken place is, of course, the fact that it did not have a clean slate to start with. The existing airlines were given "grandfather" rights under the act and became permanently entitled to fly the routes they had pioneered; but the recognition of "grandfather" rights was not, by itself, too serious a handicap to the development of an adequate air transportation system.

The real handicap has been inherent in the act itself, particularly in the authority granted the Board to fix air mail rates in accordance with the "need" of individual airlines.⁹ It was recognized by Congress that some subsidy was essential for the development of air transportation; but the approach of the Civil Aeronautics Act was new. The act has been interpreted by the Board as if it were authorized to guarantee in perpetuity mail pay sufficient to provide a fair return on any airline system considered desirable to fly, limited only by the Board's conception of public convenience and necessity. There are, of course, a few other limitations, but these have not been significant. There is the limit implied in the act by the words "under honest, economical and efficient management" (sec. 406[b]), implying that the Congress does not obligate itself to reimburse management for corruption and stupidity; but this limitation has been most difficult to apply in practice. There is also the limitation inherent in the concept of public convenience and necessity, namely, that public desirability must be weighed against public cost; but this concept seems to have had no influence at all on Board action.¹⁰

No provision is made in the act for a budget, in the light of which the cost of present operations and contemplated expenditures needs to be measured. There is no limitation to the effect that mail pay will be available only on those routes that the Post Office wants to have flown.¹¹ There is not even the limitation that air mail pay authorized for the holder of a certificate of convenience and necessity can ever be effectively stopped, despite whatever original misjudgment may have occurred in its issuance or whatever changed factors may now characterize the operation.¹² Another handicap imposed by the act is that its provisions concerning certificates of convenience and necessity are modeled after those of the Interstate Commerce Act which deal with the extension and abandonment of railroads. This forgets the fact that in the railroad industry the driving force was private initiative and the willingness of private groups to take a chance on profits and absorb losses, while in air transportation, under the provisions of the act and as it was administered by the Board (at least prior to the

⁹ Civil Aeronautics Act, sec. 406(b). See Appendix A.

¹⁰ See James M. Landis, "Air Routes under the Civil Aeronautics Act," *Journal of Air Law and Commerce*, Summer, 1948.

¹¹ Under section 405 of the Civil Aeronautics Act, the Post Office Department can be required to meet the costs of flying both routes and schedules that it deems utterly useless for postal requirements.

¹² See Oswald Ryan, "The Revocation of an Airline Certificate of Public Convenience and Necessity," *Journal of Air Law and Commerce*, Autumn, 1948.

separation of air mail pay from subsidy payments in 1953) there were to be no losses—just subsidy. (See Chapter 8.)

Criticism of the air route system as it has developed to date is frequently directed at the result, rather than at the process which has made this result almost inevitable. A portion of the air transport industry alleges too much competition has been introduced. This is true. Another portion criticizes the Board for introducing too little competition. This also is true. These are, of course, patent self-serving declarations by various air carriers. They point to certain facts but produce no answers. Nor has an answer to this problem yet been forthcoming. Indeed, the remarkable thing is that the process has worked as well as it has. From the standpoint of public need both nationally and internationally, there are few gaps in our route pattern. But as a system the pattern has its outstanding weaknesses, too often having been traded rather than engineered. The real difficulty is statutory, resting largely in the mail-pay provisions of the Civil Aeronautics Act of 1938.¹³

Local-Service Airlines

The certificated local-service carriers (or, as they have frequently been called, “feeder” airlines), occupy a unique position in the air transportation system and present competitive considerations quite different from those associated with the other domestic carriers.¹⁴ A number of considerations, based largely on the inherent characteristics of local air services, have determined the Board’s policy and shaped its thinking on the role of competition in such operations. Even at the time of the Board’s first over-all consideration of local

¹³ Much criticism has been levied against the Civil Aeronautics Board for its failure to develop an over-all domestic air transport pattern. Perhaps the two most important of such critical statements have been those of the President’s Air Policy Commission and the Congressional Aviation Policy Board. The former holds that there was “widespread confusion as to the principles which guide the C.A.B. in its route determinations” and that there was need for a “comprehensive survey of the present situation and the development of a more cohesive philosophy” for the development of a national route pattern (*Survival in the Air Age* [Washington, D.C., 1948], p. 110). The latter similarly criticized the Board and recommended that a “disinterested non-governmental agency” assist the Board in making a study of the foreign and domestic air transport systems in order to present a basic route plan which may be used as a guide for future revisions or extensions of the present route pattern (Report of the Congressional Aviation Policy Board, *National Aviation Policy*, Recommendation 33 [Washington, D.C., 1948]). The Board has so far shown little real enthusiasm for, or fundamental appreciation of, the need for making the studies recommended, stressing the difficulty in separating over-all planning of route development from its other functions.

¹⁴ This discussion is adapted from *The Role of Competition in Commercial Air Transportation*, Select Committee on Small Business, United States Senate (82nd Cong., 2d sess.) (1952).

service,¹⁵ it was clear that with the extensive airline coverage of the country already in existence, any general extension of air service to communities not already served by the trunk-line carriers would require operations to cities much smaller, on the average, than the points previously certificated.

The extent to which the Board's expectations were justified has been demonstrated by studies made in connection with its initial consideration of whether certain of the early local certificates should be extended for an additional period of time. These studies revealed that the 187 points then receiving only local air service had a total population of approximately 2,535,000, or an average per station of 13,500. Had all the points then certificated to these carriers actually been served, the average population figure for points limited to local service alone would have increased to only 18,500. The inclusion of every point then certificated for feeder service, whether served exclusively by local carriers or also by trunk-line operators, would have given an average population per point of not over 85,000, despite the addition of such metropolitan centers as New York and Los Angeles. This meant that local-service airlines would be required to tap a market not already using air transportation to any great extent and having only a limited traffic potential under existing conditions. It was also clear that local services by their very nature would be relatively short-haul operations involving numerous stops, with resulting higher costs per plane-mile than those for the long-haul operations. For example, regardless of the operator's size, the flight-costs of landing and taking off the DC-3 airplane generally used in local-service operations range upward from \$10, whether the distance between landings averages 50 or 200 miles. A substantial part of the ground and indirect costs also remains fixed, without respect to the length of flight per departure. Poor equipment utilization is another characteristic of short-haul service.

Translated into costs, therefore, the combination of short-haul traffic with frequent stops, low traffic density, and limited volume of service can add up to only one thing—a high-cost operation. The real problem, therefore, is not to insure competition, but rather to avoid diluting the limited traffic available and creating still higher costs, which might call for prohibitive amounts of government subsidy.

Under these circumstances, the Board, from the outset of its local-service authorizations, tried to avoid establishing routes that were competitive with those of other local carriers or of trunk-line oper-

¹⁵ *Local, Feeder, and Pick-Up Air Service Case*, 6 CAB 1 (1944).

ators. Moreover, in order to make certain that the carriers did not stray from their assigned tasks of providing local service and enter into the trunk-line field, the Board included in the local-service certificates restrictions against nonstop and skip-stop operations.¹⁶

The avoidance of competitive services was not universal. In some instances local-service routes were competitive with other services over certain segments. This situation arose not from any belief that the competition was desirable, but from the knowledge that in many regions sound local-route systems could not be established without including certain points already served by other carriers under their outstanding certificates.¹⁷

In all local-service renewal cases, an effort has been made to re-adjust routes in a manner calculated to strengthen the local operators and bring about a steady lessening of the difference between their commercial revenues and expenses, meaning a subsequent reduction in the subsidy outlay of the government. In the application of this policy, submarginal stations, even where their only air service came from local operators, have been dropped from the local-service routes; the services of trunk-line carriers have been suspended at points served solely by them and at such points as were added to the route of the local operator; and, in the case of points which could not

¹⁶ Perhaps the most emphatic pronouncement of the Board with respect to this policy was in connection with its decision in the *Bonanza-TWA Route Transfer Case*, 10 CAB 893 (1949): "We would like to emphasize again that we have neither the disposition nor the intention to permit local air carriers to metamorphose into trunk lines competitive with the permanently certificated trunk lines. The local-service carriers were certificated by us as an experimental effort to bring useful air transportation services into the smaller communities and the isolated or sparsely populated areas of this country and to feed connecting traffic to long-haul carriers. We recognize that some competition between local-service carriers and trunk lines is inevitable but we intend not only to minimize such competition but to prevent its development to the greatest feasible extent."

¹⁷ "From the information now before the Board we are of the general opinion that feeder service should seldom if ever be competitive. The traffic potential is so limited in most feeder territory that duplicate operations by two or more carriers can seldom if ever be economical. We have reached the conclusion that in general where a feeder carrier's route is duplicated by a trunk-line carrier and such route is not necessary to the trunk-line carrier's operation, then such route should be served by the feeder carrier alone. Conversely, where a route is a necessary and integral part of a trunk-line carrier's system and essential to its economical operation, then such a route should not be served by a feeder carrier. Where two feeder carriers substantially duplicate service between certain communities, then the feeder routes should be adjusted to avoid such duplication. Of course, these general objectives cannot be achieved immediately in many cases and may not be possible to fulfill in particular situations, but they represent salutary principles which are of importance in working out the appropriate relationship between our feeder carriers and the other certificated carriers." (*Southwest Airways Co., Pioneer Airlines, Inc., and Trans-Texas Airways Show Cause Order*, CAB Order Serial No. E-2680, dated April 4, 1949.

support two services, but were certificated to both a trunk-line and local carrier, one of the carriers has been suspended.¹⁸

In only one respect has the Board's policy of reducing uneconomical competition among the local-service carriers, and between them and the trunk airlines, called for action that might conceivably increase competition. In an effort to bring about greater traffic density and lower costs, the Board in a number of instances has relaxed the requirement that local-service carriers on each flight stop at every point. This condition was originally imposed to make certain that the carriers concentrated on developing the local services for which they were certificated, rather than on attempting to compete in the trunk-line field. Many of the more recent local-service certificates have substituted for the older restriction the requirement that on each segment the carrier stop at a minimum number of points, but less than the total number included on the segment. It is clear that in doing this the Board has carefully restricted the freedom of the carrier in order to avoid its conversion from a local to a trunk-line operator and to prevent any undue increase in competition. The limited extent to which competition may have been increased by this course of action has been an unavoidable by-product of the more basic objective.¹⁹

The Board's policy on competition for the local-service carriers does not represent any change in its basic philosophy of competition or in its belief that sound and economical competition has been and can be a powerful force in stimulating the development of a strong air transportation system. Nor does it mean that the local-service carriers lack the incentive which competition supplies. Competitive situations between the local operators and other air carriers still exist

¹⁸ For example, in the *West Coast Case*, 11 CAB 999 (1949), the Board proposed to suspend Salem, Ore., and Bellingham, Wash., from United Air Line's route and transfer these points to West Coast Airlines. In the *Southwest Renewal Case*, CAB Order No. E-2680 (1949), the Board proposed to transfer Eureka, Red Bluff, Monterey and Santa Barbara, Cal., from United Air Lines to Southwest Airways. In the *Piedmont Renewal Case*, CAB Order No. E-4876 dated November 27, 1950, the Board proposed to transfer Hickory, N.C. from Capital Airlines to Piedmont Airlines. See also *Central Renewal Proceeding*, CAB Docket No. 4083 *et al.* (1953); *North Central Route Investigation Case*, CAB Docket No. 4603 *et al.* (1951); *Ozark Certificate Renewal Case*, CAB Docket No. 5988 *et al.* (1954).

¹⁹ See, for example, *Pioneer Air Lines, Inc., Amendment*, 7 CAB 469 (1946); *Empire Air Lines*, CAB Order, Serial Nos. E-330 and E-723 (1947); *Southwest Airways*, 9 CAB 67 (1948); *Florida Case, Perry and Leesburg*, 9 CAB 1 (1948); *Pioneer Air Lines*, CAB Order Serial No. E-2938 (1949); *Southwest Airways, Additional California-Nevada Service Case*, 10 CAB 405 (1949); *Empire Air Lines and Wisconsin Central Airways*, CAB Order, Serial No. E-3203 (1949); *Feederline Certificate Renewal Case*, CAB Docket No. 3718 *et al.* (1949); *Southern Airways*, CAB Order, Serial No. E-5592 (1951); *Trans-Texas Airways*, CAB Docket Nos. 6442 and 6505 (1954); *Ozark Certificate Renewal Case*, CAB Docket No. 5988 *et al.* (1954).

and will continue to do so in a number of areas. For example, in an effort to obtain traffic from the trunk-line carriers, many of the local-service operators have established competitive fares between competitive terminal points, with the result that system fares, in terms of cents-per-mile, are sometimes lower for the local carriers than for the trunk-line carriers. Furthermore, there is no question but that the competition of surface transportation exercises a substantial influence on the local air carriers, though it is difficult to measure the extent precisely. It is important to remember that because of the nature and characteristics of local air transportation at its present stage of development, there are only very limited areas in which competition can economically be justified. Under these circumstances, the entire experiment would have been threatened with destruction if the Board's local-service policy had been to promote competition.

Nonstop Operations and Route Consolidations

The Civil Aeronautics Act provides that certificates of convenience and necessity issued to air carriers shall specify the terminal points and intermediate points, if any, between which the carrier is authorized to serve the public.²⁰ Any change in a certificate with respect to points served or junctions of routes must be approved by the Civil Aeronautics Board. Therefore, shortly after the passage of the act, when confronted with applications from holders of "grandfather" certificates to eliminate some points on certain routes so they could fly nonstop between principal traffic-generating points, the Board adopted the policy that such nonstop services could be inaugurated upon compliance with certain stipulations:

1. Service between two points on two different routes had to be operated via a junction point between the two routes, and nonstops between two such points could not be inaugurated without an amendment to the applicant's certificate.

2. Nonstop flights between two points on the same route involving a "substantial departure" from the route outlined in the applicant's certificate could be inaugurated only after the Board had found at a public hearing that the public interest was not adversely affected.

In the years between 1938 and the outbreak of World War II, a large number of nonstop applications were authorized, many of them over the protest of competing airlines or cities by-passed by such serv-

²⁰ Civil Aeronautics Act, sec. 401(f). See Appendix A.

ices.²¹ During the war years the airlines did not have enough equipment to operate many nonstop routes and at the same time maintain adequate service to intermediate certificated route points. Nor were DC-3 aircraft practically adaptable to nonstop operations. With the end of the war, however, and the advent of four-engined transports, the airlines again began to request nonstop authorizations.²²

Some of the postwar applications were opposed by other airlines on the grounds that granting such authorizations would, in effect, create a new route for which public convenience and necessity would have to be proved. The Board, however, adopted a liberal policy; this, together with the postwar acquisition by the airlines of greater numbers of high-speed, long-range aircraft, accounted for a large number of nonstop authorizations being granted.

Nonstop authorizations, however, did not permit the airlines to make full use of the greater flying range of their new aircraft, for, according to their route certificates, they still had to stop at junction points between points on two or more different routes. The logical way to circumvent this long-standing restriction, provided the Board would approve, was to consolidate certain routes so that the points wanting to be served with nonstop flights would then be on the same route.²³ To bring about route consolidations, the Board developed the policy of amending airline certificates so as to change the status of route junction points from that of a common terminal point on separate routes to that of an intermediate point on a single route.

By eliminating the necessity of stopping all flights at junction points, the airlines were placed in the position of being able to offer various improved services to the public. Substantial time and mileage savings were made in most instances by the more direct routings and by taking full advantage of the operational characteristics of large, fast aircraft. However, amendment of airline certificates to consolidate routes entailed considerably more than the usual aspects of oper-

²¹ See, for example, *American Airlines, Non-stop Operation between Washington, D.C., and Chicago, Ill.*, 1 CAA 210 (1939); *Eastern Air Lines, Birmingham-New Orleans Non-stop Service*, 2 CAB 596 (1941); *United Air Lines, Fresno-Sacramento Non-stop Service*, 3 CAB 1 (1941).

²² See, for example, *National Airlines, Jacksonville-Miami Non-stop Service*, 6 CAB 313 (1945); *Transcontinental and Western Air, Detroit-St. Louis Non-stop Service*, 6 CAB 471 (1945); *Northeast Airlines, Consolidation of Routes Nos. 27, 65 and 70*, 6 CAB 541 (1945).

²³ See, for example, *Northeast Airlines, Consolidation of Routes Nos. 27, 65 and 70*, 6 CAB 541 (1945); *American Airlines, Consolidation of Routes Nos. 7, 21 and 23*, 6 CAB 279 (1945); *American Airlines et al., Consolidation of Routes*, 7 CAB 337 (1946); *Transcontinental and Western Air et al., Consolidation of Routes*, 8 CAB 28 (1947); *Eastern Air Lines et al., Consolidation of Routes*, 8 CAB 580 (1947).

ational economies and administrative savings. It caused changes to be made in service patterns, some of which were noncompetitive and of benefit to a substantial number of passengers, but many of which involved diversion from one carrier to another and had a serious competitive effect. A considerable number of the nonstop flights made possible through route consolidations brought about exact duplication, and in some instances triplication, of services.

In approaching the issue of nonstop flights, one must, of course, recognize that the network of airlines has now been built up to the point where the domestic route pattern serves nearly all important areas and centers of population. It is virtually impossible, therefore, to authorize any new service which does not affect an existing operation to some extent. The introduction of larger and faster aircraft has intensified the situation, since their greatest utility lies in long-haul services between large traffic-generating points, and these services tend to cut across existing route patterns. Increased capacity and speed mean that the amount of traffic which might have supported duplicating operations with prewar equipment will not necessarily support such operations with postwar equipment. To illustrate, a Convair 240 provides three times as many daily seat-miles as a DC-3, the DC-6 and Constellation about five times as many.

Authorization by the Board of all possible nonstop operations would, in effect, result in superimposing upon the present route pattern a second network of air transportation with considerable variation from that now established. Depending on the availability of traffic and mail pay, the through-service features would lead to the entry of many airlines into traffic centers or gateways which they do not presently serve and to the authorization of extensive new and additional operations over major segments, resulting in more direct competition in the future.

The Board has applied certain standards of public convenience and necessity in numerous opinions involving the establishment of new competitive relationships.²⁴ A major consideration is whether the pro-

²⁴ *American Export Airlines, Transcontinental Service*, 2 CAB 16 (1940); *American Airlines et al., East-West California*, 4 CAB 297 (1943); *Transcontinental and Western Air, North-South California*, 4 CAB 373 (1943); *Colonial Airlines et al., Atlantic Seaboard Operation*, 4 CAB 552 (1944); *Western Air Lines et al., Denver-Los Angeles Service*, 6 CAB 199 (1944); *Northwest Airlines et al., Chicago-Milwaukee-New York*, 6 CAB 217 (1944); *Eastern Air Lines et al., Great Lakes-Florida*, 6 CAB 429 (1945); *West Coast Case*, 6 CAB 961 (1946); *Hawaiian Case*, 7 CAB 83 (1947); *Mississippi Valley Case*, 8 CAB 726 (1947); *Milwaukee-Chicago-New York Restriction Case*, 11 CAB 310 (1950); *T.W.A. Route Consolidation Case*, CAB Docket No. 2581 et al. (1950); *Reopened Southern Service to the West Case*, CAB Docket No. 1102 et al. (1954).

posed duplication would be productive of substantial benefits to the public. The amount of diversion which any proposed duplicating services would inflict upon other carriers is also an important element. Another significant principle followed in formulating Board policy is whether the proposed duplicating services would usefully serve a public need which cannot and will not be adequately served by existing authorizations.

In passing upon route-consolidation applications, the Board has recognized the special problems confronting the carriers and has permitted them appropriate leeway in order to meet operating problems that arise from day to day and are best left to managerial discretion. However, the Board cannot overlook its regulatory function of surveillance over any potentially competitive nonstop operations which would depart from the sphere of a carrier's present service and are not now justified. Moreover, the granting of unlimited nonstop authority would be even more speculative than the usual route authorization, at the time of decision, by reason of future developments which might show that the stability of other routes would be affected and that the traffic could be better served by another carrier. Any nonstop operations which would upset competitive relationships, would result in substantial diversion from another carrier, would not serve a public need, and would not be logical in developing the route pattern of the applicant's system should not be permitted under route consolidations.

Interchange of Equipment

Until after World War II, the air transport industry had relatively little experience with the interchange of equipment between connecting carriers. Before that time Western Air Express (operating between Los Angeles and Salt Lake City) and United Air Lines (operating between Salt Lake City and cities to the east thereof) entered into an interchange agreement which provided for through sleeper-plane service between Los Angeles and various eastern points,²⁵ but this operation was terminated during the war. After the close of the war the Board became interested in the possible need for similar arrangements between airlines. These would make it possible, without authorizing additional routes or route extensions, to eliminate the necessity of traffic being transferred at connecting points. With this in

²⁵ *United-Western Interchange Case*, 1 CAA 723 (1940).

mind, the Board approved a number of through-service interchange operations.²⁶

Most of the interchange operations were voluntarily proposed by the airlines concerned. The Board, however, took the position that it had the authority not only to provide the terms and conditions of such operations, but also to compel single-plane service by means of interchange whenever this seemed in the public interest.²⁷ The Board has also denied a number of interchange applications deemed not in the public interest on grounds that they would create uneconomic competition.²⁸

In dealing with the subject of through service by means of interchange agreements, the Board has laid down certain principles to guide its judgment:

It would appear to be fundamental that the interchanges which would best satisfy the public interest would be those which would cause the minimum interference with the existing route pattern and this, of course, save in exceptional cases, would favor interchanges that were not dependent upon new route extensions with their attendant cost and competitive implications to implement them. It would also seem to be a basic requirement that sound interchanges would provide an improved through service over reasonably direct routes. And finally, it should be considered that the interchange arrangement which would be most consistent with the public interest would be one which would leave substantially undisturbed the historical participation of the various existing carriers in the traffic movement to be served, and which would not cause undue diversion.²⁹

²⁶ The Board has held that through-service arrangements are in the public interest and do not violate the provisions of the Civil Aeronautics Act, whether they contemplate that the crews change at the interchange point. (*United-Western Interchange Case*, 1 CAA 723 [1940] and *TWA-Delta Interchange Case*, 8 CAB 857 [1947] or that crews go through with the planes (*Pan American-Panagra Agreement*, 8 CAB 50 [1947] and *Capital-National Interchange Case*, 10 CAB 231 [1949])). The Civil Aeronautics Act, secs. 404(a) and 1002(i), gives the Board the power to require interchange service to be instituted or continued, with the same power over the adequacy of such service as it has over the adequacy of service provided by a carrier on its own routes. See also *Eastern Air Lines et al., Great Lakes-Florida*, 6 CAB 429 (1944); *Northwest Airlines et al., Chicago-Milwaukee-New York*, 6 CAB 217 (1944); *Detroit-Washington Case*, 8 CAB 487 (1947).

²⁷ *Through Service Proceedings and Kansas City-Memphis Florida Case*, CAB Dockets 3426 *et al.* and 1051 *et al.* (1950); *Southern Service to the West Case*, CAB Docket No. 1102 *et al.* (1951).

²⁸ *National Route Investigation*, CAB Docket No. 3500 *et al.* (1951); *National Airlines, Inc., Pan American-Grace Airways, Inc., Interchange Agreement*, CAB Docket No. 3785 (1951); *Chicago & Southern Air Lines, Inc., Pan American World Airways, Inc., Interchange Agreement*, CAB Docket No. 4863 (1952); *Reopened Southern Service to the West Case*, CAB Docket No. 1102 *et al.* (1953).

²⁹ *Southern Service to the West Case*, CAB Docket No. 1102 *et al.* (1951).

In spite of the industry's limited experience with interchange of equipment, such arrangements appear to have a much greater chance of use in any immediate reshaping of the airline route structure than do mergers or route transfers. Possible stumbling blocks are the aspirations of individual airlines to expand and the difficulty of exchanging equipment and parts for the many types of aircraft used by different airlines, but there appears to be no serious obstacle to the feasibility of interchange. No valid objections have been raised in any of the cases, so far decided, on the grounds of safety; and interchange has been shown to be effective from an operational standpoint since it makes use to the fullest extent of existing stations, existing facilities, and existing operations, and even existing schedules. Interchange turns into a one-plane service a two-or-more-plane service that has usually been operated for a number of years by two or more carriers. From the standpoint of the public, the interchange of equipment means that travelers will no longer be required to change at connecting points, thus avoiding the problems of missed connections and the delays and nuisance involved in transferring baggage. In other words, interchange permits the schedules of two or more airlines to be so closely knit as to provide the benefits of one-carrier service to points on the systems of two or more carriers which cannot support one-plane through service.

Interchange of equipment encourages through-traffic arrangements without extending airline routes and without increasing overhead cost as much as would be necessary if a route were extended. The advantages of interchange are threefold: (a) costs of operations are much lower than in extending a route of a carrier; (b) it may be a means of strengthening a short-haul or regional carrier which ordinarily would not receive the benefits of traffic moving beyond its terminal; and (c) it may eliminate what is now branded excessive competition between points, since an interchange avoids the necessity of duplicating or extending routes but at the same time offers substantially the same service to the public. Had interchange agreements been made more extensively during the expansion period immediately after World War II, there might have been a more constructive development of the air route pattern without duplicating route certifications.

Irregular Air Carriers

Shortly after the effective date of the Civil Aeronautics Act, the Board took action in connection with what were then termed "non-

scheduled operations." Such services were authorized without compelling the operators to comply with the economic and safety requirements of the act, and this Board action has become one of the most highly controversial economic regulations in our air transport history.³⁰ Nonscheduled operations were defined as follows:

Within the meaning of this regulation any operation shall be deemed to be nonscheduled if the air carrier does not hold out to the public by advertisement or otherwise that it will operate one or more airplanes between any designated points regularly, or with a reasonable degree of regularity, upon which airplane or airplanes it will accept for transportation, for compensation or hire, such members of the public as may apply therefor or such express or other property as the public may offer.

During World War II it became apparent that the Board's policy toward the nonscheduled carriers might have to be changed, and an investigation of such services was launched in 1944.³¹ The result was an amendment of the previous exemption making it obligatory for nonscheduled carriers to "register" with the Board, the abandonment of the term "nonscheduled," and the creation of a classification of "irregular air carriers." This revised Economic Regulation 292.1 became effective on June 10, 1947, and was in use during most of the period of postwar growth of the noncertificated air carriers.

Irregular carriers were divided by the Board into two groups, large and small, the distinction depending upon the size and take-off weight of the aircraft employed.³² An irregular air carrier in domestic trans-

³⁰ Economic Regulation 292.1, effective August 22, 1938. The first safety regulations governing nonscheduled carriers became effective August 1, 1946, and were entitled "Non-scheduled Air Carrier Certification and Operation Rules." See John P. Moore and K. Robert Hahn, "Regulation of Irregular Air Carriers," *Cornell Law Quarterly*, Fall, 1949; Victor S. Netterville, "The Regulation of Irregular Air Carriers: A History," *Journal of Air Law and Commerce*, Autumn, 1949; Charles R. Cherington, "The Essential Role of Large Irregular Air Carriers," *Journal of Air Law and Commerce*, Autumn, 1952; *Report on Role of Irregular Airlines in United States Air Transportation Industry, Select Committee on Small Business, United States Senate* (82nd Cong. 1st sess.) (1951); *Future of Irregular Airlines, Select Committee on Small Business, United States Senate* (83rd Cong. 1st sess.) (1953).

³¹ *Investigation of Nonscheduled Air Services*, 6 CAB 1049 (1946).

³² Large irregular air carriers were defined as those utilizing aircraft with an allowable gross take-off weight in excess of 10,000 pounds or a number of aircraft which together had allowable gross take-off weights exceeding 25,000 pounds. Small irregular air carriers were those operators with smaller units of equipment. Later (1947), small irregular carriers were defined as those who do not use in their transport services aircraft having a maximum certificated take-off weight in excess of 12,500 pounds for any one unit, or 25,000 pounds for the total of such units. Still later (1952), the "small irregular" classification was dropped and these operators were termed "air taxi operators," those who use only aircraft units having a maximum certificated take-off weight of 12,500 pounds or less, without regard to the number of such units being used. Starting in 1954, the Board began referring to the large irregular carriers as "irregular service carriers."

portation was permitted to engage in both passenger and freight operations; while in the international field, the irregular operator was restricted to the movement of property. To qualify as an irregular carrier the applicant was required merely to file a request for a letter of registration with the Board. The Board defined an irregular carrier as one which:

does not hold out to the public, expressly or by a course of conduct, that it operates one or more aircraft between designated points, or within a designated point, regularly or with a reasonable degree of regularity, upon which aircraft it accepts for transportation, for compensation or hire, such members of the public as apply therefor or such property as the public offers. No air carrier shall be deemed to be an irregular air carrier unless the air transportation services offered and performed by it are of such infrequency as to preclude an implication of a uniform pattern or normal consistency of operation between, or within, such designated points.

Presumably the Board felt that it had, by the above definition, circumscribed the operating authority of an irregular carrier. But despite this and even more detailed discussions of "irregularity" contained in various Board orders subsequently issued,³³ a noncertificated air transport industry developed. Some 140 of these operations, with equipment ranging from one or two to as many as twenty DC-3 or DC-4 airplanes each, provided a variety of services, including local and transcontinental "coach type" accommodations, which the certificated airlines have since adopted. In addition to their large capital investments, many were of sufficient size to employ hundreds of technical and operating personnel. In view of the complexity of the Board's formula of "irregularity," it is probably safe to assume that where doubts existed they were resolved by the operators in favor of their own activities. It also appears that the Board was either ham-

³³ See, for example, the consent order adopted in the matter of *Trans-Caribbean Air Cargo Lines, Inc.*, CAB Order, Serial No. E-370, Docket No. 2593 (1947), wherein the Board defined the permissive scope of irregular operations. "... regularly or with a reasonable degree of regularity, which regularity is reflected by the operation of a single flight per week on the same day of each week between the same two points, or is reflected by the recurrence of operations of two round-trip flights, or flights varying from two to three or more such flights, between any same two points each week in succeeding weeks, without three intervening other weeks or approximately similar periods at irregular but frequent intervals during which no such flights are operated so as thereby to result in appreciable definite breaks in service: it being intended by this subparagraph to require irregularity in service between any such points but not to preclude the operation of more than one or two such flights in any given week, nor to prescribe any specific maximum limitation upon the number of flights which may be performed in any one week, if frequency and irregularity of service is otherwise achieved through variations in numbers of flights, and intervals between flights and through frequent and extended definite breaks in service. . . ." Identical language was used by the Board in final orders in many subsequent enforcement proceedings.

pered in its enforcement activities by a lack of personnel or else was willing to permit the situation to develop, feeling that, by attrition and by the philosophy of the survival of the fittest, the problem of regulation would ultimately take care of itself.³⁴ In any event, it was not until August, 1948, that the Board announced a series of actions affecting all large irregular air carriers moving passengers and property under the then existing exemption authority. At this time the Board (a) instituted a general investigation into the practices and activities of the large irregular air carriers, (b) froze applications for letters of registration for large irregular carriers as of August 6, 1948, and (c) directed its staff to re-evaluate Economic Regulation 292.1 in light of the experience gained since its original promulgation.

In the meantime, possibly in anticipation of more strict action by the Board, many of the large irregular operators filed applications for individual exemptions to secure a more liberal operating authority than they had previously been allowed.³⁵ In practically all instances, these applications were dismissed; and in numerous enforcement proceedings, initiated by the Board, cease and desist orders were issued or letters of registration were revoked.³⁶

The general investigation initiated by the Board into activities and practices of large irregular air carriers in August, 1948, resulted in the promulgation of a new revision of Section 292.1 on December 10, 1948, to become effective in May, 1949. The most important feature of the new regulation was its withdrawal of the blanket-exemption authority hitherto conferred upon large irregular carriers and its requirement that each carrier make a new application for an individual

³⁴ See Moore and Hahn, *op. cit.*

³⁵ See exemption requests of *Seaboard and Western Airlines, Inc.*, CAB Docket No. 3304 (1948); *Trans-Caribbean Air Cargo Lines, Inc.*, CAB Docket No. 2123 (1948); *Air America*, CAB Docket No. 3491 (1948); *American Air Transport, Inc.*, CAB Docket No. 3670 (1948); *Standard Airlines, Inc., et al., Exemption Request*, 9 CAB 583 (1948).

³⁶ Most enforcement proceedings were met with dogged resistance and resourceful defense tactics by the irregular operators. *Standard Airlines* was one of the first to take the matter into the United States District Court for the District of Columbia, seeking to restrain the Board from a cancellation of its letter of registration (*Standard Airlines, Inc. v. CAB*, 177 Fed. [2d] 18 [1949]). The Court ruled that "the determination of whether a carrier has forfeited the right to operate as an Irregular Carrier is a matter for the Board, in the first instance at least, to decide." See also *Transocean Air Lines, Inc., Enforcement Proceeding*, 11 CAB 350 (1950); *Viking Airlines, Noncertificated Operations*, 10 CAB 401 (1950); *Investigation of Seaboard & Western Airlines, Inc.*, 11 CAB 372 (1950); *Meteor Air Transport, Inc.*, CAB Docket No. 4100 (1951); *Arrow Airways Enforcement Proceeding*, CAB Docket No. 4199 (1951); *Oxnard Sky Freight Enforcement Proceeding*, CAB Docket No. 4590 (1951); *Modern Air Transport, Inc., Exemption Application*, CAB Docket No. 3854 (1951); *American Air Transport and Flight School, Inc., Enforcement Proceeding*, CAB Docket No. 5209 (1952).

exemption order authorizing continued irregular operations. Some 96 operators filed applications pursuant to this regulation.

On May 25, 1950, the Board issued its opinion, based upon its general investigation into the operations of the large irregular carriers,³⁷ and announced the policies that would guide it in disposing of applications for individual exemptions. Without attempting a detailed review of all the reasoning underlying these policies, a brief summary can be given as follows:

1. Applications of irregular carriers that had been conducting route services, described by the Board as "a pattern of operations which shows a concentration of relatively frequent and regular flights between a limited number of pairs of points," were to be denied.

2. Exemptions were to be granted to those carriers which in the past had been furnishing truly irregular services.

3. The Board concluded that:

It must be recognized that the temptation to engage in route operations will continue in the future as to those carriers which receive exemption authority. Indeed, since the number of irregular carriers utilizing large aircraft will be smaller and the competition between them lessened to that extent, the temptation will probably be greater than it has in the past. Although the carriers which will receive exemption authorization at the present time have conducted irregular services in the past, we nevertheless deem it necessary to impose further restrictions to insure that each such carrier will carry out and perform the type of service which it is our intention to authorize. Accordingly, in addition to the restrictions upon regularity which have heretofore been imposed, we shall permit only three flights in the same direction during any period of four successive calendar weeks between the following pairs of points, and only eight flights in the same direction in such period between any other pairs of cities.

The Board then listed 13 pairs of cities between which the bulk of the operations of irregular carriers had been conducted and between which operations had been characterized by frequency and regularity.³⁸

4. Applications of nonoperators were to be denied. This had refer-

³⁷ *Large Irregular Carriers, Exemptions*, 11 CAB 609 (1950).

³⁸ In order to place the carriers granted individual exemptions and those still operating under the provisions of part 291 of the regulations on an equal footing, the Board followed this action with an amendment of part 291 that added the so-called "3 and 8" limitation to the regulation. The effective date of the amendment was postponed several times at the request of the Small Business Committee of the Senate and before it became effective a United States district court, in a suit brought by two large irregular carriers, held the amendment invalid as having been promulgated without observance of proper procedures. An appeal from this ruling was made by the Board but has not yet been settled.

ence to the large number of irregular carriers which, although holding valid letters of registration, had not conducted any operations in the preceding year.

The next major step in the regulation of irregular carriers came on March 2, 1951, when the Board issued a special exemption authorizing unrestricted operations by large irregular carriers pursuant to military contracts and the establishment of joint representatives at military bases to arrange for flights of uniformed military personnel traveling at their own expense to or from military bases. Also, the Board approved two organizations of irregular carriers, the Aircoach Transport Association and the Independent Military Air Transport Association, for the purpose of representing such carriers before the executive branch of the United States Government and in order that the irregulars' equipment, personnel, and services might most expeditiously be utilized by the Department of Defense.

This was the situation in the regulation of large irregular carriers on September 21, 1951. On that date the Board issued an order instituting a general investigation of air services by large irregular carriers and irregular transport carriers.³⁹ The investigation was directed to all matters related to and concerning air transportation conducted by irregular carriers, including an inquiry into the issue of whether there is "a need for the air-transportation services now conducted by the irregular carriers in addition to and supplemental to services performed by the carriers holding certificates of public convenience and necessity." The investigation also covered many subsidiary issues, such as whether, if such supplemental services were found to be required, what type or types of service would best meet the public need and whether such services should be authorized by certificate of public convenience and necessity or by exemption.

The institution of this general investigation, still under way in 1955,⁴⁰ and the temporary suspension of any further processing of the individual exemption applications did not portend a cessation of enforcement activities against those irregular carriers which continued to ignore the provisions of the exemption regulation under which they were operating. The Board, in fact, made it plain that it

³⁹ *Large Irregular Carriers and Irregular Transport Carriers*, CAB Docket No. 5132 *et al.*, Order Serial No. E-5722 (1951).

⁴⁰ In January, 1954, the Board in Order No. E-8052 (Docket No. 5132 *et al.*, *Large Irregular Carriers and Irregular Transport Carriers*) decreed that in this proceeding issues with respect to the requirements of the public interest and the public convenience and necessity be decided before hearing further evidence on the qualifications of individual applicants.

could not condone violations of the act or the regulations pending disposition of the proceeding in the general investigation.⁴¹

Even though the irregular carriers were not originally visualized as major competitors of the scheduled lines, and whatever their place may ultimately be in the transportation of passengers by air, there is no escaping the fact that up to the present time they have been a significant force in the competitive picture (see Chapter 3). Although this competitive impact has extended to both the passenger and cargo fields and to domestic and international operations, it has not been felt uniformly in all areas. For example, it appears that in the transportation of freight the competitive influence of the irregular carriers has been less important in the domestic than in the international field. Since the Board's exemption regulations conferred no authority to conduct passenger operations in foreign air transportation, the competitive influence on passenger services has necessarily been limited to operations within the United States and between it and its Territories.

On the whole, large irregular carriers have concentrated their flights on the most important route segments between the heaviest traffic-producing points and have devoted an overwhelming part of their efforts to the lucrative long-haul traffic. For example, of a total of 16,189 flights (including those for the military) operated by large irregular carriers and irregular transport carriers during a recent year, 52 per cent were over five route segments, and 65 per cent were over 11 segments. The remaining flights were widely scattered. Under this pattern of operation it necessarily follows that in such high-density, long-haul markets as New York-California and New York-Miami, to mention only two, services by irregular carriers would be highly competitive with the certificated airlines. It also follows that between a much greater number of points served by the scheduled carriers, the irregular carriers have only a slight competitive effect, suffering from the dual drawbacks of low density and short haul.

⁴¹ In September, 1951, the Board revoked the operating authority of Air Transport Associates, Inc. (CAB Docket No. 4265). In March, 1952, the Board suspended the operating authority of American Air Transport (CAB Docket No. 5209). In September, 1952, enforcement proceedings were instituted against Air America, Inc. (CAB Docket No. 5657) and in March, 1953, enforcement proceedings were started against North American Airlines, Trans National Airlines, Trans America Airways, Twentieth Century Airlines and Hemisphere Air Transport (CAB Docket No. 6000). In 1953 enforcement proceedings were brought against still other irregular carriers such as Peninsular Air Transport (CAB Docket No. 6124), North American Airlines (CAB Docket Nos. 5774 and 5928), and Air America, Inc. (CAB Docket No. 5766). In fact the Board was so active in connection with revocations and enforcement that some felt it was moving rapidly in the direction of eliminating the major irregular carriers long before the completion of the over-all hearing.

There is no indication that their competition has exerted any important pressure toward the development of new and improved equipment. With minor exceptions, the transport equipment utilized by the irregular carriers has consisted of surplus military aircraft, many of the type used heavily by the certificated trunk-line carriers in the early postwar era as transitional aircraft. Even today, with one exception, the large irregulars do not operate aircraft of as advanced design as those utilized by the certificated trunk lines in the major competitive markets. Much the same situation exists in the other areas where competition as to service might occur.

As far as passenger fares go, however, the situation is different, and there the influence of the irregular carriers has been strongly felt. From the beginning of their operations, a substantial number of the irregular air carriers have concentrated on operating nonluxury services in the high-density markets at fares substantially below the standard fares of the certificated carriers. The irregular carriers, by operating in markets, under conditions, and at times when high-density seating could be realized and, consequently, lower fares charged, helped to bring about the development of low-fare coach services of the type that have accounted for the largest portion of the recent growth in domestic passenger business of all air carriers. Such low-fare coach services have served as a competitive stimulus to the certificated carriers in the low-cost field, and, together with the coach services of the certificated carriers, have induced many persons to travel by air who would not have utilized air services at the higher standard fares.

The irregular carriers have offered competition not only to the certificated carriers, but also have fought strongly among themselves for the available low-cost market. Although this latter competition has been felt somewhat by all irregular operators, it has had its strongest influence with respect to those relatively few of the noncertificated carriers who have accounted for the bulk of the business.

The problem facing the Board under this situation has been to evaluate the beneficial and detrimental results that have in the past flowed from irregular air-carrier operations and that may be expected to result in the future, and on the basis of that evaluation to bring about a scheme of authorizations that will promote a sound air transportation system. On the basis of the record, the Board concluded in the *Transcontinental Coach-Type Service Case*⁴² that the benefits stemming from a general authorization to the noncertificated applicants

⁴² CAB Docket No. 3397 *et al.* (1951).

to conduct unlimited transcontinental coach services were not sufficient to outweigh the detrimental effects it would have upon the air transportation system as a whole. The question of the nature and extent of any authorization to be granted the irregular carriers to conduct supplementary services, falling short of the operations conducted by the certificated carriers, will be decided in the so-called "large irregular" investigation. Here the opposing parties have an opportunity to present evidence upon which the Board can base its decision.

It should be pointed out, in conclusion, that, despite frequent statements to the contrary, the Board's actions have not all been directed at restricting the scope of operations of the irregular carriers nor have its policies resulted in economic strangulation of the irregular carrier industry. The military exemption previously referred to represents a substantial authorization. It has become increasingly obvious that the type of irregular operation, comparable to a tramp steamer service, which was contemplated by the Board's original blanket-exemption order and which many operators started out to perform seems to have limited economic possibilities. It is quite possible that a certain number of irregular operators could, through a more energetic cultivation of the aircraft charter field, develop a considerable volume of business for special movements involving the charter of complete aircraft. Aside from the possibilities of certification of bona fide charter operations, the large irregulars have as yet been unable to suggest a field for their activities which on a long-term basis offers much hope of economic survival. The small irregular operators, of which there are over 2,000, appear to find the present Board regulations satisfactory from the standpoint of giving them the necessary authority to conduct the type of fixed-base operations in which most of them are engaged⁴³ (see Chapter 3).

⁴³ For a detailed analysis, pro and con, of the entire subject of irregular air carrier regulation and the related subject of the feasibility of certain coach operations then being conducted chiefly by nonscheduled operators, see "Airline Industry Investigation," *Hearings before the Committee on Interstate and Foreign Commerce, U.S. Senate (81st Cong., 1st sess.)* (April and May, 1949), particularly statements by James Fishgrund, pp. 260, 823; James M. Landis, pp. 211, 295; Joseph J. O'Connell, Jr., pp. 249, 494; C. R. Smith, p. 741. See also CAB, *Statement of Action on Applications for Permission to Carry Groups on Special Transatlantic Charter Trips*, May 20, 1950; CAB, *Policy Statement on Authorization of Large Irregular Carriers*, May 26, 1950; *The Role of Competition in Commercial Air Transportation, Select Committee on Small Business, United States Senate 82nd Cong., 2nd sess.* (1952), pp. 21-31; *Large Irregular Air Carrier Investigation*, CAB Docket 5132 *et al.* particularly the *Initial Decision of Examiners* served March 29, 1955.

The Air Coordinating Committee in its report to the President, *Civil Air Policy*, in

Mergers and Acquisitions

The provisions of the Civil Aeronautics Act dealing with mergers and acquisitions of one air carrier by another are more complex than those applying to the award of certificates, for not only must the public interest be considered but no transaction is to be approved which creates a monopoly and thereby restrains competition or jeopardizes another carrier.⁴⁴ As interpreted by the Civil Aeronautics Board, this permits the approval of arrangements that restrain competition or jeopardize another carrier so long as they do not arise from a monopoly condition.⁴⁵ It then becomes important for the Board to decide what constitutes a "monopoly." The Board has chosen to define monopoly in the economic sense of control of the market place and has rejected the antitrust definition which considers it as "restraint of competition."⁴⁶ Thus, by its findings as to the degree of control present, the Board possesses wide latitude to approve or disapprove agreements endangering competitors. In essence, the Board asserts that

1954 made the following observations concerning nonscheduled airline operations: (1) The intent of the Civil Aeronautics Act, to establish a pattern of controlled entry with regard to common carrier air transportation, is still sound. (2) The exemption authority of section 416 of the Civil Aeronautics Act should be used only in limited and exceptional circumstances and should not be used as the basis for any significant departure from the controlled entry principle. (3) The concept of nonscheduled service does not provide a meaningful basis for exempting route-type passenger services from the normal certification requirement. In the future, there should be no general use of the exemption authority as a basis for authorizing common carrier transportation to individually ticketed passengers on large transport planes. (4) Those operations of the large irregular carriers which represent a supplementary type of service, such as bona fide charter and contract operations, should be encouraged. A new type of certificate should be developed for such operations, providing suitable flexibility in terms and areas to be served. (5) Irregular operations now conducted with small aircraft present no serious regulatory problem under their present exemption status and there appears to be no need for changing this status.

⁴⁴ Civil Aeronautics Act, sec. 408(b). See Appendix A.

⁴⁵ *United Air Lines-Western Air Express, Interchange of Equipment*, 1 CAB 723 (1940). In this case, the Board approved a sleeper-plane interchange agreement between Western and United which eliminated an inconvenient connection at Salt Lake City. This transaction jeopardized another carrier, but the Board stated a principle to which it has generally adhered: "If . . . competitors are to be prevented from inaugurating improvements in service solely as a protection to a particular air carrier, the development of an adequate air transportation system in this country will be retarded rather than assured." In another case, *Northwest Airlines, Consolidation of Routes*, 7 CAB 100 (1946), Northwest was permitted to operate directly to Butte, Montana, from Portland, Oregon, since a saving of 60 minutes in travel time outweighed the ill effects of revenue diversion from United Air Lines at Portland.

⁴⁶ In *United Air Lines-Western Air Express, Interchange of Equipment*, 1 CAA 723 (1940), the Board exhaustively examined the various definitions of monopoly. The legal definition conceives a monopoly as a restraint of competition, and the antithesis as free competition; whereas to the economist, monopoly is control of the market, and its antithesis is pure competition.

there may be restraint of competition without a simultaneous increase in control of the market place.

The Board has apparently regarded one of its first objectives as that of preventing the emergence of a "super carrier." In denying approval of a proposed merger which would have made the applicant the largest domestic system,⁴⁷ it was emphasized that certain routes of the contracting parties served the same population centers; and the proposal was criticized not on the size of the proposed organization but because of the concentration of control of a particular market place that would result.

In a subsequent proceeding the Board was confronted with a proposed acquisition of a strong regional carrier by American Airlines, already the largest domestic carrier.⁴⁸ Since the two airlines did not serve the same territory but merely crossed at one point, additional control of the same market was not involved. Classifying the two systems meeting in the one small area as impossible of "integration," the Board denied the application, thus using another reason to forestall the development of any carrier dominant either in the control of a specific market or in the matter of route size.

Another Board policy concerned with mergers, consolidations, and sales has been developed in furtherance of its declared intention to assist the small airlines. Failure of the Board's route-award policy to reduce the great difference in the size of the airlines has drawn attention to the possibility of consolidating a number of the smaller carriers; but the almost total absence of examples of voluntary mergers or consolidations among smaller lines, designed to provide competition for major air carriers, suggests that this method has only a limited possibility. The lack of success which has characterized the exercise of moral suasion to encourage private agreements on beneficial consolidations and sales has influenced some Board members to consider the use of some means of enforcing mergers of smaller units into transcontinental or multi-regional airlines.⁴⁹

⁴⁷ *Acquisition of Western Air Express by United Air Lines*, 1 CAA 739 (1940). The proposal would have merged United, one of the three transcontinental carriers at that time and the second largest of the seventeen domestic lines then certificated, with Western, a north-south regional carrier and one of the eight largest airlines then operating.

⁴⁸ *American Airlines, Inc., Acquisition of Control of Mid-Continent Airlines*, 7 CAB 365 (1946).

⁴⁹ See former Chairman Welch Pogue's "concurring and dissenting" opinion in *Northwest Airlines, Chicago-Milwaukee-New York*, 6 CAB 217 (1944). Former Chairman James M. Landis was of the same opinion. See *Aviation Week*, November 3, 1947, p. 51. There have, however, been a number of cases where the Board has disapproved mergers: *United Air Lines Transport Corp., Acquisition of Western Air Express Corp.*, 1 CAA 739

At times the Board has tended to approve mergers and sales seemingly because of a dread of the supposedly evil effects of bankruptcy upon the reputation of the air transportation industry and a desire to eliminate inefficient management.⁵⁰

The most bitterly fought merger case to come before the Board in the first twelve years of its history involved the acquisition by Pan American World Airways of American Overseas Airlines.⁵¹ This was at first denied by the Board but soon after permitted in compliance with a directive from the President of the United States, issued under

(1940); *American Export Airlines, Inc., Acquisition of Taca, S.A.*, 3 CAB 216 (1941); *Alaska Air Lines, Inc., et al., Service to Anchorage, Alaska*, 3 CAB 522 (1942); *Acquisition of Cordova Air Service, Inc., by Alaska Airlines, Inc.*, 4 CAB 708 (1944); *Braniff Airways, Inc., et al., Acquisition of Aerovias Braniff, S.A.*, 6 CAB 847 (1946); *National-Caribbean-Atlantic Control Case*, 6 CAB 671 (1946); *American Airlines, Inc., Acquisition of Control of Mid-Continent Airlines, Inc.*, 7 CAB 365 (1946); *Southwest-West Coast Merger Case*, CAB Docket No. 4405 (1951); *Continental-Pioneer Acquisition Case*, CAB Docket No. 6457 et al. (1954).

⁵⁰ *Western-United Acquisition of Air Carrier Property*, 8 CAB 298 (1947). The Board approved a privately arranged sale by Western to United of the right to operate a specific route and permitted a purchase price that was twice the value of the tangible assets at depreciated cost. This excess amount was paid for the intangible asset, the certificate of public convenience and necessity previously granted by the Board to Western at no charge. By approving this transaction the Board moved contrary to an express provision in the act (sec. 401[f]) which states that no proprietary interests are conferred on the holder of a certificate. In an earlier case, *Western Air Lines, Acquisition of Inland Air Lines*, 4 CAB 654 (1944), the sale was approved in order to eliminate Inland's inefficient management, although there was scant opportunity for integration since only 5.22 per cent of Inland's traffic traveled over Western's routes.

⁵¹ The case history leading up to the final Board order permitting the merger (*North Atlantic Route Transfer Case*, 11 CAB 676 [1950]) is of interest: December 13, 1948—Merger proposal first announced, providing payment for American Overseas Airlines in Pan American Airways common stock. Agreement was to terminate September 13, 1949. June 24, 1949—Six weeks of hearings ended, one of the longest on record, with a transcript of testimony filling 3,873 pages. September 13, 1949—CAB proceedings not concluded; agreement between the two airlines extended to March 13, 1950, with option to June 13. The agreement was amended to provide payment of \$17,500,000 cash for American Overseas Airlines instead of stock trade. December 22, 1949—The Board's examiner issued a report favoring the merger. March 1, 1950—Oral argument by Pan American Airways and American Overseas Airlines as well as intervenors, Trans World Airlines, and a group of American Overseas Airlines employees before the Board. May 17, 1950—Board disapproved sale by 3 to 2 vote. June 6, 1950—Pan American Airlines—American Overseas Airlines agreement extended to June 30, and from there on extension was a few days at a time. June 29, 1950—President Truman approved CAB decision. June 30, 1950—President Truman recalled his approval. July 10, 1950—President Truman wrote to the acting chairman of the CAB stating that he had decided to approve the sale. July 10, 1950—CAB reversed itself and issued an order approving the sale, route transfer, and consequent merger. July 11, 1950—President Truman approved the revised decision. July 12, 1950—Seaboard and Western Airlines and a group of American Overseas Airlines employees (Brian O. Sparks et al.) obtained a court order restraining the Board from issuing anything but its original opinion. July 13, 1950—The Department of Justice representing the CAB asked to have the restraining order dissolved. July 14, 1950—Trans World Airlines asks Board to stay issuance of second decision. July 17, 1950—Restraining order lifted, and Board issues decision approving sale after denying Trans World Airlines motion.

his power to approve or disapprove matters concerning international routes of American-flag airlines. (See Chapter 10.) The reasons advanced for approval were: (a) Revival of normal transatlantic traffic had been slow following the close of World War II and the expected volume of business did not justify three competing United States Carriers if excessive subsidies were to be avoided. (b) American Overseas Airlines had experienced difficulty in obtaining capital for future expansion. (c) Pan American World Airways operating economies expected to result from the merger would help to reverse the trend toward greater use of foreign-flag lines, which had increased their proportion of transatlantic business from 24 per cent to 37 per cent in the previous year. (d) It was held that Pan American World Airways was operating under a competitive disadvantage over the North Atlantic since, unlike American Overseas Airlines and Trans World Airways, it lacked affiliated transcontinental routes in the United States which could feed traffic into its overseas routes.

The Board's general policy toward mergers and consolidations has been developed to the point where the following may be stated as the minimum criteria:

1. In merger cases the Board will examine the transaction to determine whether it will aid in effectuating the purposes of the Act.⁵² In other words, before a merger transaction is approved, there must be a finding that it will result in tangible public benefits. The burden of proof is squarely upon the applicants to show that the merger will aid in effectuating the purposes of the Act. A mere negative showing by the applicants that the merger is not adverse to the public interest is not sufficient.

2. The merger must help create an integrated and co-ordinated transport system properly adapted to the needs of commerce. One of the most important factors which must be determined by the Board in a merger is whether the two route systems will form an integrated pattern of air service. Although this question need not be answered in the affirmative to the exclusion of all other factors, it is nevertheless an important consideration in determining the extent of public benefits expected to result from the merger.⁵³

⁵² *American Airlines, Inc., Control of Mid-Continent Airlines, Inc.*, 7 CAB 365 (1946); *Southwest-West Coast Merger Case*, 11 CAB 999 (1950).

⁵³ The Board pointed out in *National-Caribbean Atlantic Control Case*, 6 CAB 671 (1946), that "a carrier's routes should be adapted to the normal flow of air traffic. If these conditions are not met, the attainment of an economically sound operation is likely to be difficult." See also *American Control of Mid-Continent Case*, 7 CAB 365 (1946).

3. The merger must result in substantial tangible benefits to the public through improved service.

4. The interests of labor must be protected.⁵⁴ Each case is carefully examined by the Board to see that justice will be done each set of employees affected by any merger of airlines. Some of the matters considered are integration of seniority lists of the merged companies; displacement allowances for employees who are not deprived of their employment as a result of a merger, but are retained in positions offering lower compensation than they received prior to the merger; dismissal allowances; traveling and moving expenses for employees who must as a result of a merger change their place of employment; and protection in real estate matters so that employees will not suffer in having hastily to dispose of their real estate interests and thus not obtain the fair market value of their property.⁵⁵

Although there have been several mergers of domestic trunk airlines (of which Braniff/Mid-Continent and Delta-Chicago and Southern are the most important) and also several local service airlines (of which Monarch-Arizona and West Coast-Empire⁵⁶ are the most important), the Board's policy on mergers and sales has been only partially successful.⁵⁷ The power to approve mergers has not been used as an affirmative weapon of Board policy, perhaps because of the Board's belief that the most effective method of overcoming the difference in size of the carriers was through the award of new route certificates. As a result of the Board's route policy, however, there may be too many systems. If so, a means must be found for their better integration. As the history of the railroads abundantly illustrates, merging or consolidation seldom takes place voluntarily. Some propulsive force from outside is necessary if real progress is to be made.

⁵⁴ In two cases the Board, in considering labor protective provisions, adopted certain provisions of what had come to be known as the "Burlington Formula" because of its use in railroad merger cases. In these decisions the Board noted, however, that while the conditions there adopted were correct for each case, it in no way intended to prejudice future cases. *United-Western, Acquisition of Air Carrier Property*, 11 CAB 701 (1950); *North Atlantic Route Transfer Case, Supplemental Opinion*, CAB Order Serial No. E-4634, adopted September 22, 1950, and Order Serial No. E-4659, adopted September 25, 1950.

⁵⁵ In more recent cases the Board has used what it terms the "Braniff/Mid-Continent Formula." *Braniff/Mid-Continent Merger Case*, CAB Docket No. 5376 (1952); *Delta-Chicago and Southern Merger Case*, CAB Docket No. 5546 (1952), *Flying Tiger-Slick Merger Case*, CAB Docket No. 6047 (1954).

⁵⁶ *Monarch-Arizona Merger Case*, 11 CAB 246 (1950); *West Coast-Empire Case*, CAB Docket No. 5220 (1952).

⁵⁷ See Paul D. Zook, "Recasting the Air Route Pattern by Airline Consolidations and Mergers," *Journal of Air Law and Commerce*, Summer, 1954.

Merging or consolidating airlines would appear to be much easier than merging railroads. Airlines have great flexibility, with their chief asset a certificate of convenience and necessity, a "franchise which gives them a right-of-way in the sky." There is no heavy investment by air carriers comparable to that expended by railroads in roadbed, terminals, and other fixed-property investments.

Actually, however, airline mergers have been very difficult to bring about, with each project beset by many obstacles. Once agreement at the executive level is accomplished, proposals must then obtain sanctions from the separate boards of directors and after that approval from stockholders. Dissident groups can place any compromise plan in jeopardy.⁵⁸

⁵⁸ For an interesting and revealing discussion of some of these matters see the Report of Examiner Edward T. Stodola in *Eastern-Colonial, Acquisition of Assets*, CAB Docket No. 5666 and *National-Colonial Integration Investigation*, CAB Docket No. 5569 (1953).

Chapter

8 ★ CIVIL AERONAUTICS BOARD POLICY— MAIL RATES

THE exercise of its jurisdiction over rates and charges, for the transportation of mail, passengers, and property by air,¹ is one of the most important continuing responsibilities of the Civil Aeronautics Board. Airlines are required to file rate schedules for passengers and freight with the Board, which, in turn, may approve or suspend the proposed rates or may promulgate a schedule of its own choice.² Mail rates are not set by the airlines but by the Board itself.

Mail Rates and Subsidy Payments

The fixing of mail rates have had a fourfold significance in connection with the national policy for the development of adequate air services:

1. The rates have had to provide compensation to the carrier for the services performed in carrying the mails. When payments for transporting mail do not exceed the fully allocated costs borne by the carriers for performing the service, the mail rate is said to be a service rate.

¹ Civil Aeronautics Act, secs. 403, 404, and 406. See Appendix A.

² Civil Aeronautics Act, sec. 403 and 1002(d) and (g). The Board possesses limited power to fix international rates to the extent necessary to correct discrimination but has frequently requested Congress to extend its powers over such rates (Civil Aeronautics Act, sec. 1002 [f]). In determining rates for the carriage of persons or goods, the Civil Aeronautics Board is specifically directed by the act (sec. 1002 [e]) to take the following factors, among others, into consideration: (a) The effect of such rate upon the movement of traffic. (b) The need in the public interest of adequate and efficient transportation of persons and property by air carrier at the lowest cost consistent with the furnishing of such service. (c) Such standards respecting the character and quality of service to be rendered by air carriers as may be prescribed by or pursuant to law. (d) The inherent advantages of transportation by aircraft. (e) The need for each air carrier for revenue sufficient to enable such air carrier, under honest, economical, and efficient management, to provide adequate and efficient air carrier service.

2. The mail rates have, in certain circumstances, provided compensation to the carrier in excess of the fully allocated costs of carrying the mail. This has been in effect a payment to the carrier for providing a service required in the interests of the postal service, the commerce, and the national defense made available before and beyond what the then commercial traffic would justify the carrier in supplying. In the early years of the industry, when operations were limited in scale, it was possible to establish mail rates that would make up the deficiency in commercial revenues and provide a fair return on the investment. For most of the carriers that day is past; commercial traffic has so far outstripped mail traffic and volume has so expanded that no politically possible mail rate would suffice to guarantee a fair return on the present scale of over-all operations.

3. Mail payments may offer a device to assure efficiency and economy in management. Under the Civil Aeronautics Act a carrier is entitled to reasonable compensation only so far as its operations are soundly planned and economically managed. Costs under economical and efficient management constitute the yardstick by which reasonable rates are measured.

4. Mail rates may be so administered as to further the attainment and preservation of sound competitive conditions.

It should be recognized that the term "subsidy" in connection with mail rates has generally been used by those who discuss such payments to the airlines without any exact meaning, and with connotations as various as the purposes of those employing the term. Many people hold that a "subsidy" to the airlines exists in fact only if they receive mail payments which support dishonest, uneconomical, or inefficient managements or which permit the carriers to earn excessive or exorbitant profits, and that in all other cases, some party other than the carrier is the beneficiary of any "subsidy" that is paid. In other words, if the carrier develops an essential service before the commercial traffic is sufficient to justify and support that service, it is thought that the payment of some of these costs is a "subsidy" to those who benefit or use the service.³ Similarly, if the Post Office Depart-

³ In May, 1950, Senator Edwin Johnson, then Chairman of the Senate Committee on Interstate and Foreign Commerce, proposed a system of separation of air mail pay from subsidy under which all pay above a compensatory rate to each carrier would be earmarked as subsidy. This subsidy, on the basis of an unrevealed formula, would be re-allocated as subsidy to the communities to which uneconomical airline service was being furnished. Senator Johnson found that, for the fiscal year 1949, of the \$47,431,070 mail pay to the sixteen domestic trunk airlines, \$24,750,286 was compensatory pay and \$22,680,784 subsidy. Of this subsidy, \$17,973,369 was to communities being rendered uneconomical

ment pays more for the carriage and handling of air mail than it receives from the sale of stamps used on such mail, it is held that the "subsidy" accrues to the users of the service rather than to the carriers. However, the difference between the receipts of the Post Office and the estimated costs of handling the air mail by the Post Office cannot be said to measure the proper cost of the air carriage of the mail, since the difference might be greater or less than the costs of air carriage and since it might reflect an unreasonable postage rate or something less than attainable efficiency in postal operations or a questionable allocation of postal costs that placed an undue burden of general overhead on the air mail revenues. Equally inappropriate is any attempt to measure "subsidy" by the difference between the rates paid for the carriage of mail and the rates charged for other classes of traffic. Mail is relatively costly traffic to handle, since schedules may have to be adapted to the needs of the postal service; mail requires special precautions in its handling; mail does not load and unload itself; and, despite unpredicted variations in volume, mail must move promptly.

Prior to the passage of the Civil Aeronautics Act of 1938, air mail rates were based on contracts between individual carriers and the Post Office Department, with payment according to formulas varying from time to time and from carrier to carrier. For example, the Air Mail Act of 1925, known as the Kelly Act, provided that air mail postage rates be not less than 10 cents per ounce or fraction thereof and that contracts for the transportation of air mail might be made at rates not in excess of four-fifths of the revenues from air mail postage. It soon became obvious that the administration of the law would require the tabulation of the postage carried by all air mail letters and its allocation among contract routes, in order to determine the compensation of the respective carriers. The Postmaster General therefore recommended that the act be amended to provide for payments to the carriers at fixed rates per pound.

During the early years of air mail transportation, the Post Office Department generally took the position that adjustments should be

service and \$4,707,415 was to the carriers. Of the \$10,365,037 in mail pay to the nine feeder airlines operating throughout the fiscal year of 1949, \$1,221,996 was compensatory pay and \$9,143,041 subsidy. Of the subsidy, \$7,105,827 was to communities and \$2,037,214 to the carriers. Airline executives, who have long supported the thesis that the airlines' "need" mail pay is largely a subsidy to small towns rather than to the airlines themselves, "applauded Johnson's recognition of who really benefits from the subsidy; but pointed out that breaking down subsidy on a community-by-community basis is a monumental—if not impossible—task for a Civil Aeronautics Board which is already far behind in its work." See *Aviation Week*, May 29, 1950, p. 54.

made in individual-contract mail rates to enable the carriers to meet the costs of transporting the mails and that aid, relatively small in amount and temporary in character, should be extended to cover the deficits on the passenger service, whether such service was rendered jointly with, or apart from, mail service. Such aid was to be confined to the major routes, with the idea of giving them the incentive to continue operations until the public became educated to travel by air.

In 1930 a mail-pay formula was set up by the Watres Act passed in that year.⁴ It was intended to build a rate structure capable of application to any air mail route in the United States. Instead of the direct determination of rates for particular routes upon the basis of the cost experience on such routes, differences in load and in operating conditions were compensated for by so-called "variables." Bad terrain was held to justify extra compensation of 2 cents per mile, and frequent fog, 2.5 cents. Schedules requiring night flying were to be compensated for by the payment of an additional 15 cents per mile. Radio equipment and the use of multi-engine planes also called for special allowances. Recognition also was given to the number of passenger seats provided, although the amounts set up were relatively unimportant. The latter variables were less important as an aid to passenger service than the indirect aid which resulted from the fact that, under the formula, a large portion of the costs of flying the planes was to be met by mail payments, whether space was reserved for 200 or 2,000 pounds of mail. The mail-load variable did not increase in proportion to the amount of mail carried, 55 cents a mile being paid for carrying 200 pounds and 95 cents for carrying 2,000 pounds.

Under the original and revised Watres Act formulas,⁵ the distinction which had previously existed between compensation for mail service and payments in aid of passenger service was abandoned in practice. Air mail carriers were expected to provide passenger service on flights previously scheduled only for mail, and the transporta-

⁴ For the legislative history see *U.S. Daily*, January 15 and 16, 1930, Vol. IV, pp. 3127 and 3138, and Vol. V, p. 3154; *71st Cong., 2d sess., House Report No. 9500, Sen. Doc. No. 3578, House Report No. 11704*; "Amending Air Mail Act," *Hearings before House Committee on the Post Office and Post Roads (71st Cong., 2d sess.)* (February 19, 1930), pp. 1-60; *71st Cong., 2d sess., House Report Nos. 966 and 1209, Sen. Report No. 524; Congressional Record*, Vol. LXXII, pp. 7372-79, 7618; *Statutes at Large*, Vol. XLVI, pp. 259-60.

⁵ The original Watres Act formula was placed in effect May 1, 1930. Other formulas went into effect on April 1, 1931, January 1, 1932, November 1, 1932, July 1, 1933, and September 1, 1933. See Francis A. Spencer, *Air Mail Payment and the Government* (Washington, D.C.: Brookings Institution, 1941).

tion of mail was authorized on flights previously devoted only to passenger transportation. The mail and passenger services, which had largely been separate activities prior to the Watres Act, were thus combined into a joint mail and passenger service. The separate determination of the cost of mail service as distinguished from the cost of the joint service became difficult and was not attempted by the Post Office Department.

Up to 1932, air mail contracts, like those for ocean mail, were frankly used to subsidize companies to which these contracts were awarded. With the change in the federal administration in 1932, both types of arrangement became subject to violent attack. The chief objection to the practices which had been followed by the Post Office Department before that time was that the department had not permitted competitive bidding, and it seems to have been a fact that the Post Office Department had awarded contracts to lines which might not have received them if competition in bidding had been entirely free. This had been done by discarding offers on the ground that bidders were not responsible, by inserting terms in proposed contracts which not all operators could meet, by granting extensions to existing routes instead of asking for public bids, and by encouraging conferences between operators before bids were submitted. There were also complaints that the prices which the government had agreed to pay for mail carriage were exorbitantly high. On the other hand, critics were unable to show that conditions which had been inserted in contracts were improper. The extension of existing routes had been authorized by the law of 1930 (Watres Act); and the conferences which occurred between operators, at least so far as they were suggested by the Postmaster General, appear to have been for legitimate purposes consonant with the public interest. And finally, while the sums specified in the contested contracts for the carriage of mails had admittedly exceeded the cost of the service rendered, mail contracts had always been regarded as subsidies; and some excess of price over cost was therefore to be expected.⁶

As mentioned in earlier chapters, all air mail contracts were canceled early in 1934; but the Air Mail Act of June 12, 1934, authorized the Postmaster General to award new contracts for the transportation of air mail between such points as he might designate and for

⁶ *Hearings before a Special Committee on Investigation of Air Mail and Ocean Mail Contracts, U.S. Senate (73rd Cong., 2d sess.)* (1934), testimony Wadsworth, pp. 2341-49). See also discussion in S. Daggett, *Principles of Inland Transportation* (3d ed.; New York: Harper & Bros., 1941), chap. vi, and "United States Aviation and the Air Mail," *Fortune*, May, 1934.

initial periods of not exceeding three years to the lowest responsible bidder at fixed rates per plane-mile.⁷ The Interstate Commerce Commission was directed to determine and fix the fair and reasonable rates of compensation for the transportation of air mail over each air mail route, and to prescribe the method or methods—by weight, space, or some other criterion—for ascertaining such rates of compensation. These rates were to be set so as to keep the aggregate cost of the transportation of air mail within the limits of the anticipated postal revenue therefrom. In arriving at this determination, the Commission was directed to disregard losses resulting, in its opinion, from the unprofitable maintenance of nonmail schedules in those cases where the Commission might find that the gross receipts from such schedules failed to meet the additional operating expenses occasioned thereby.⁸

By the Civil Aeronautics Act of 1938, the jurisdiction of the Interstate Commerce Commission over air mail rates was transferred to the Civil Aeronautics Authority (now the Civil Aeronautics Board). In making this transfer, the whole system of contracts was abandoned; and henceforth the airlines were to notify the Post Office Department by what schedules and between what points they proposed to operate with air mail. The Postmaster General might change these schedules, subject to appeal to the Civil Aeronautics Board; but otherwise they became effective. Once the schedules were established, the Post Office Department might then tender mail for transportation on any scheduled planes. The rates to be paid for the service were to be fixed by the Civil Aeronautics Board.

The provisions in the Civil Aeronautics Act⁹ requiring that all

⁷ The act placed a limitation on the base rate which could be fixed in any contract to not more than 33½ cents per plane-mile for transporting a mail load not exceeding 300 pounds. Payment was to be at the base rate fixed in the contract for the first 300 pounds or fraction thereof plus one tenth of such base rate for each additional 100 pounds of mail or fraction thereof, computed at the end of each calendar month on the basis of the average mail load carried per mile over the route. In no case was payment to exceed 40 cents per plane-mile.

⁸ The Interstate Commerce Commission considered the question of compensation to contractors for air mail carriage in a decision handed down in 1935 (206 ICC 675). The rates fixed in this decision followed those set in the Air Mail Act of 1934, using the maximum of 33½ cents per pound where conditions were least favorable and cutting the maximum to as little as 24 cents when conditions permitted. The Commission felt burdened by the responsibilities placed upon it and welcomed the relief which occurred in 1938, when the Civil Aeronautics Authority was created and was given jurisdiction over air mail rates.

⁹ The act provides that mail rates must be "fair and reasonable." But more important than this is the requirement that the Board consider the need for compensation sufficient to insure performance of such service and, together with all other revenue of the air

other revenues of the carriers be considered in fixing mail rates have caused the Board to approach the establishment of such rates on an individual-airline basis, giving consideration to the over-all revenues of each carrier and fixing a single rate for all of that carrier's operations. The single rate for the entire operations of each carrier is calculated to minimize the cost of mail payment to the government, since the profits from more lucrative routes must be used to support those less profitable before any unprofitable routes are entitled to support from mail payments.¹⁰ The Board, however, departed from this policy in the case of several airlines operating so-called "stub end" foreign routes.¹¹ The action of the Board in refusing to offset domestic earnings against international losses was protested by the Post Office Department, which took the case to the United States Court of Appeals.¹² The court directed the Board to consider all income of an airline in determining air mail rates. In other words, if there were any profits from domestic operations, they would have to be used to offset losses from foreign operations. Actually only four airlines were affected by this decision. These were Braniff International Airways, Delta-C. & S.

carrier, to enable such carrier under honest, economical, and efficient management to maintain and continue the development of air transportation to the extent and of the character and quality required for the commerce of the United States, the postal service, and the national defense. The Board has held that ". . . the use of the mail payments is a statutory device for the accomplishment of national objectives that transcend the interests of the postal service. Those objectives . . . encompass the maintenance and continued development of air transportation to the extent and of the character and quality required for the commerce of the United States, the Postal Service, and the national defense. The 'compensation' which the carrier receives thus becomes compensation not only for carrying the mail but for the building up of a system of air transportation which will service the nation's commerce and security as well. . . ." (*Pan American Airways Co., Mail Rates*, 1 CAA 220 [1939]). See also *Western Air Lines, Inc., and Inland Air Lines, Inc. Mail Rates*, CAB Docket No. 2870 *et al.* (1950).

¹⁰ An airline operates as a system, not as a singly controlled group of independent routes; and one of the primary reasons for the success of some operators has been their skill in welding the various routes into an integrated system. All airlines freely interchange their planes among their several routes. Schedules originating on one route frequently terminate on another. Operations, traffic, advertising, and sales departments function as units for the benefit of the whole system interdependent upon each other. Few, if any, of the activities or expenses of an airline, except those which are definitely localized by fixed ground facilities, can be considered as pertaining to any single route. Many of the expenses of operation and a minor part of revenues are of such nature and are received or incurred under such circumstances that it is impossible to assign them directly to the route involved. Approximately 48 per cent of the operating expenses of a typical well-managed airline must be divided and allocated to the various routes operated by it, by arbitrary process of division, because of the circumstances under which they are incurred.

¹¹ See, for example, *National Airlines, Inc.*, CAB Docket Nos. 3037 and 3248 (1952); *Delta Air Lines, Inc., Mail Rates*, CAB Docket No. 6110 (1953).

¹² *Summerfield v. Civil Aeronautics Board*, Civil Action, District of Columbia, No. 11,351.

Air Lines, Northwest Orient Airlines and Trans World Airlines, all of which are engaged in both domestic and international operations, heretofore classified by the Board as separate units for rate-making purposes. Pan American World Airways, the only United States-flag international operator without any domestic operations, was not affected. The most drastic result of the court decision would be the possible necessity of dropping international routes of all the combined domestic-international airlines. This would leave Pan American World Airways as the only international United States-flag operator.

Maximum operating efficiency by the airlines and the fullest development of air transportation is achieved by placing and retaining carriers on final mail rates, under which they either reap the benefits or stand the losses from future operations. Where those rates are class-service rates, as they are now for domestic operations, there is the additional advantage that airlines are forced to compete domestically with other carriers of their class in securing revenue and in reducing or controlling costs. Under these circumstances the air transportation system will benefit from fixing final rates for domestic divisions in advance of the international (where both are operated by one airline), rather than retaining the entire air carrier systems on a temporary or cost-plus basis during the lengthy period necessary for fixing a final system rate, or for simultaneous fixing of division rates. Moreover, even if the entire air carrier systems are used as the rate-making units, present domestic earnings will not support international operations, and it may be expected that the carriers will simply become subsidized on a system, rather than a division, basis. This would carry no long-range attendant benefits, and merely serve to destroy the benefits which have been flowing from the Board's classification and rate-making policies. In addition, domestic earnings would no longer be available for providing improved domestic services and for reducing domestic rates. Treating the entire airline system as the rate-making unit for those engaged in international operations would, moreover, discriminate between carriers, since those engaged in only domestic operations will be permitted to retain their profits, whereas those engaged in both types of operations will be required to use their domestic profits to support their losing international operations. Under these circumstances the airlines involved may attempt to withdraw from international operations and the Board may find it necessary to approve such withdrawals. A reluctant

operator can hardly be said to serve the best interests of the United States in the international field.¹³

The mail rates applied by the Civil Aeronautics Board have been arbitrarily classified by that body as "service" mail rates or "need" mail rates, depending upon whether the mail payment reflects only compensation for the service of mail transportation alone or contains additional amounts representing federal aid needed by the carrier to maintain and continue the development of air transportation.¹⁴ This results in considerable differences between airlines in the amount of mail pay received per ton-mile of mail carried.

Service mail rates are applied to ton-miles or pound-miles of mail volume. Such a rate takes into account the fact that there are fixed costs in providing the minimum capacity requirements of the mail service as well as cost economies incident to increased density of mail traffic. To reflect fixed costs, a capacity factor equivalent to an average daily load of 500 pounds for a specified mileage may be used in computing minimum mail payments. To reflect economies incident to increased mail volume, a rate of, for example, 80 cents per ton-mile is applied to the volume equivalent to 400 pounds carried over one schedule per day and a lower rate of 70 cents per ton-mile for volume in excess of this amount.¹⁵

Need mail rates have generally been stated as an amount per plane-mile flown. Such plane-mile rates are made subject to an automatic adjustment provision which reduces the mail rate per plane-mile as the average daily designated mail mileage is increased over

¹³ See "Court Ruling Seen as Threat to Flag Routes," *Aviation Week*, February 15, 1954.

¹⁴ The "service" rate was at first computed by separating the cost of carrying the mail from other expenses and then fixing a rate, based on anticipated mileage, which would return this cost plus a reasonable return on the allocated investment necessary for the mail service. "Investment" is calculated on original, rather than reproduction, cost (*Eastern Air Lines*, 3 CAB 733 [1942]; *American Airlines*, 3 CAB 770 [1942]). Accurate apportionment of expenses and investment was difficult; and the Board later concluded that it would not be required, at least during the so-called "transitional" period (*Eastern Air Lines*, 6 CAB 551 [1945]). In a decision involving a "need" carrier in the feeder category, the Board fixed a sliding-scale rate geared to passenger loads in such a manner as to provide substantial incentive to the carrier to develop passenger business (*Pioneer Air Lines, Inc.*, 8 CAB 175 [1947]). In other cases, temporary increases in air mail rates have been permitted carriers on the basis of a system of assumed, or "false," mail loads, without changing the carriers' basic rate itself (*Western Airlines Mail Rates*, CAB Docket No. 1374 [1947]).

¹⁵ See, for example, *Pennsylvania-Central Airlines Corp.*, 8 CAB 980 (1947); *Transcontinental and Western Air*, CAB Docket No. 2849 (1947); CAB Show Cause Orders, Serial Nos. E-1351, E-1352, E-1353, E-1354, E-1355 (March 29, 1948); *American Airlines*, 9 CAB 926 (1948); *United Air Lines*, 9 CAB 930 (1948); *Caribbean-Atlantic Airlines, Inc.*, 11 CAB 1074 (1949).

a specified base mileage. The effect of this formula is to provide approximately the same monthly amount of mail payments, notwithstanding increases in mail mileages flown. When the mileage operated decreases below the base mileage, however, mail payments are decreased correspondingly.

In the case of local-service airlines, the Board has adopted various formulas in order to set the need rate on a sliding-scale incentive basis. One of these methods makes mail pay vary with the passenger load factor, the maximum mail rate being made effective when the minimum passenger load factor is realized and the mail rate declining as the passenger load factor increases, so prescribed that the rate allows a progressive increase in the profit earned. Another method makes mail pay vary with the number of round trips flown daily over each route segment of the particular airline, declining as the carrier becomes older and in all probability, more self-sufficient. The idea behind such formulas is to create a method in each case to meet the demonstrated "need" of the carrier but at the same time to operate in such a way as to reduce mail payments as the carrier further develops its nonmail traffic.¹⁶

The provision in the Civil Aeronautics Act that the Board must consider economy and efficiency of management in setting mail rates is important. It poses to the Board and to the carriers the necessity of determining the characteristics of economic and efficient management in air transportation. Thus far such efforts have not met with much success, however, even though in two cases the Board went to the length of denying extra subsidy in order that a carrier might switch from one type of aircraft to another.¹⁷ This is probably because there are numerous difficulties in the way of determining economy and efficiency of management in the airline industry. In ordinary business, economy and efficiency can be gauged, in large part, by the amount, or at least the rate, of profit which individual companies make. While a yardstick is applicable to air transportation, the act clearly recognizes that the profit criterion cannot be used in the same sense that it is used elsewhere in business. In fact, the act authorizes

¹⁶ See, for example, *Piedmont Aviation, Inc.*, 11 CAB 1054 (1949); *Midwest Airlines, Inc.*, 11 CAB 1047 (1949); *Turner Airlines, Inc.*, 11 CAB 1078 (1950); *Central Airlines, Inc.*, 11 CAB 1048 (1949).

¹⁷ In both cases the local-service airlines concerned were refused permission to switch from DC-3's to Martin 2-0-2's on the grounds that underwriting the cost of this experiment would not assist in introducing into service a new aircraft type or an aircraft primarily suited to local air service, and that the need for subsidy would be unduly increased. See *Pioneer Air Lines, Inc., Mail Rate*, CAB Docket No. 5499 (1953); *Southwest Airways Co., Mail Rates*, CAB Docket No. 5696 (1953).

the Board to set different mail rates for different air carriers or classes of air carriers. It need scarcely be pointed out that air routes vary widely in such characteristics as traffic density, length of haul, operational difficulties, and many other factors. The airline manager, unlike the average businessman, is not free to make changes in service or routes at will and frequently must continue to give at least minimum service even though such service is unprofitable to him.

There have been at least two basic defects in the system of air mail and subsidy payment as it has developed: (a) As the act was administered, air transportation became essentially a "cost plus" operation for a high proportion of the industry. Such a development was not contemplated when the Civil Aeronautics Act was passed by Congress. (b) There were no standards which provided for the payment of identical compensation for rendering identical service.

It was the intent of Congress, when it provided the "need" section of the Civil Aeronautics Act,¹⁸ that the Civil Aeronautics Board should be equipped and empowered to "aid" the air carriers, if and when facts and circumstances justified such action in the national interest. There is no language in the act and no clear statement of Congressional intent which would "guarantee" the solvency and the continued operation of individual air carriers. There is, therefore, no justification in the act for a policy of "cost plus" operation. The lack of standards other than an airline's "need" for payment in the transportation of mail represented a discouraging situation to the efficient operator between 1938 and 1953. One company transported mail between two terminal points, using modern equipment and adequate schedules. Another company operated along the same route, serving the same terminal points, but providing a mail service of substantially less utility than the first. But the second of the operators received two to ten times as much as the first operator for transporting a pound or ton of mail between the two identical points. And, furthermore, if the first operator found a way of reducing his cost, he was likely to have his rate reduced. He might, at the same time, find the rate of his competitor increased by reason of greater "need" for additional mail compensation. It is difficult to conceive of a system doing more to discourage incentive and a high degree of managerial ability. Often, rather than offering an incentive to do their best, such a system of mail payment offered the airlines a reward for lack of results. Civil Aeronautics Board action to overcome this situation is discussed later in this Chapter.

¹⁸ Civil Aeronautics Act, sec. 406(b). See Appendix A.

To obtain mail pay, an airline first petitions the Board for some specified amount. Such petitions set forth estimates of operating revenues and expenses, and the carrier's reported operating results. These figures are analyzed for an annual period to determine the carrier's "need." At this point, the carrier's petition may be set down for formal hearing before an examiner of the Board. This process requires that the carrier supply exhibits and data to support his position, and involves procedural steps of an Examiner's Report and a final decision by the Board. Another, and usually accepted procedure, is to have informal conferences between airline representatives and members of the Board's staff to determine the amount of mail pay required for the individual operation. This latter procedure is usually more expeditious because of its informality.

The total amount of mail pay determined for a particular carrier is generally based on a compromise between the estimates of the airline and the estimates of the Board staff, after a review of the factors and information produced in the informal conference or at the hearing. The carrier may appeal to the Board if it does not agree with the staff recommendations, but where the informal procedure has been used, such appeals are rare because of the time and expense involved.

When a new carrier, such as a local-service airline, begins operations, it is granted temporary mail pay to provide it with some subsidy and service income, pending the accumulation of operating experience sufficient to determine a final total mail pay rate. The temporary rates do not allow for profit. Such rates theoretically are supposed to cover the carrier's operating costs, but so many items of expense are usually disallowed or deferred for future consideration, that the carriers operating on temporary rates are almost certain to take a loss. Company directors frequently must make expenditures which they regard as essential, in spite of knowing they may be disallowed. Prior to determination of a final rate, the temporary rate is subject to adjustments.

A final rate supersedes a temporary rate and includes provision for taxes and profits. It is set when an airline's operations have stabilized sufficiently that its commercial revenues and total expenses may be projected and thus, its mail pay need determined. Because of the backlog of cases before the Board, and the great length of time involved in setting a final mail rate, such rates usually include a "past" period of operations (which really amounts to a retroactive increase in mail pay) as well as a rate for a "future" period, which may be higher or lower than the past period rate. Once a final rate is

set, there are no retroactive readjustments. A final rate remains in effect until the carrier petitions for an increase, or until the Board itself issues a "show cause order" asking for evidence why the rate should not be reduced. In either case, the final rate automatically reverts into temporary status. If airlines are going through a period of expansion, as they have in recent years, and therefore cannot predict revenues and costs with reasonable accuracy, they take the safest course by petitioning for a new mail rate as soon as a final rate is set, thus avoiding substantial elements of risk.¹⁹

A final mail rate, in combination with all other operating income, is generally intended to yield the carrier from 7 to 8 per cent return on its investment, after taxes. This is really more a target rather than a guarantee, even to the carriers whose honesty, economy, and efficiency have not been questioned. As a practical matter an airline seldom, if ever, earns anything like that figure. In special cases such as those in which a carrier's capital was exceptionally small or had been wiped out by losses, the Board has occasionally awarded a carrier a specified profit per mile flown, since a return based on the amount of invested capital would clearly have provided inadequate compensation for services rendered.

The Service Mail Rate

All the methods devised prior to 1951 for the payment of air mail compensation had one important defect. None provided for a separation of those amounts paid out for the service of carrying the mail and those paid out as subsidy to the carriers. Nothing in the Civil Aeronautics Act of 1938 changed this situation. The Board was primarily concerned in the immediate prewar years with determining fair and reasonable mail compensation for the carriers and with adjudicating new route cases. During the war itself the situation was so completely abnormal that the Board did not attempt to establish a mail rate formula that would provide a measure of division between service rates and subsidy rates.

Following the end of World War II, however, the Board became keenly aware of the need to separate service payments and subsidy payments from the whole mail payment. Various formulas for deter-

¹⁹ In the case of final rates, the Board's cost allowances, while more liberal than in the case of temporary rates, are sometimes arbitrary and often unpredictable. An example of the former is the practice of not recognizing as a proper expense executive salaries in excess of \$15,000, which figure was recently increased from \$12,000. Another is the Board's "rule of thumb" that working capital in excess of three months' cash requirements is excessive and therefore not entitled to a return.

mining the subsidy separation cropped up all over the air transport industry. In the meantime, Congress had instituted a preliminary study, by a private management consulting firm, to prepare for legislation effecting a separation of service and subsidy payment in mail to the carriers.²⁰

In the meantime, the Board had been proceeding with a long-pending mail rate case, involving the Big Four airlines,²¹ which it had initiated on February 21, 1949, hoping to establish a rate that would contain no element of subsidy. After lengthy meetings and discussions between the staffs of the various carriers and the Board, general conclusions were reached and on August 7, 1951, the Board announced a mail payment rate for the Big Four of 45 cents per ton-mile, beginning January 1, 1951, and projected into the future. Each of the Big Four had been receiving higher mail compensation on a temporary basis, pending this final determination. The Board's decision, therefore, resulted in the Big Four carriers repaying the U.S. government about \$5 million. The Board held the 45 cent rate to be strictly a "service" rate and entirely free of any subsidy to these carriers.²²

During the course of the Board's study of what should be paid as a service rate, there were some who urged that little or no attempt should be made to arrive at the *cost* of mail service and that the rate should be set on the *value* of the service. This alternative had been frequently suggested in other rate cases, particularly before the Interstate Commerce Commission, as a way of avoiding the inaccuracies and uncertainties of arriving at the cost of services common to various types of traffic. The Board however stated:

We are not aware that this method offers greater accuracy and certainty. We rather feel as did the Interstate Commerce Commission on the occasion when it said that: ". . . As between the two cardinal principles of rate making—the cost of service and the value of the service—the first is decidedly more capable of exact determination and mathematical expression than the latter. If, as some would have us believe, no measure has yet been discovered for ascertaining the cost of the service, what measure is there suggesting anything definite and tangible and sufficiently practical in its application to carry conviction which can be applied to the value of the service?"²³

²⁰ This study was made by the accounting firm of Ernst and Ernst. See *Hearings on Departments of Commerce, etc. Appropriations for 1951, Subcommittee of the Senate Committee on Appropriations (81st Cong., 2d sess.)*; Edwin C. Johnson, "Proposed Senate Action on Air Mail Subsidies," *Journal of Air Law and Commerce*, Summer, 1950.

²¹ American Airlines, Inc.; Eastern Air Lines, Inc.; Trans World Airlines, Inc.; United Air Lines, Inc.

²² CAB Docket No. 2849 *et al.* and Docket No. 3663 (1951).

²³ *Boileau v. P. & L. E. R. R. Co.*, XXII I.C.C. Rep., 652 (1911–12).

The Board realized, of course, that the value-of-service concept has been employed in various degrees in fixing some commercial rates. Such products as coal and gravel are regarded as moving at railway rates below fully allocatable costs. (It should be pointed out in this connection, however, that the recent development of more refined accounting methods, together with comprehensive gathering of specific data, have substantially narrowed what was once considered large bodies of "fixed" costs in certain common-product industries, with the result that the value-of-service concept has been employed less and less, at least in the sense of "what the traffic will bear.") The inappropriateness of applying the value-of-service concept to air mail rates primarily stems from the fact that the government is the only purchaser of the mail service, and its ability to buy is limited only by its policies and financial resources. Under these circumstances application of the value-of-service concept might result in mail rates high enough to give the carriers whatever amounts are needed to enable them to perform the service, including amounts to cover losses on passenger and freight services, and render futile all effort to separate subsidy from mail payments. Nor do the rates charged by the Post Office Department for air mail provide an independent test of the value of the mail service, since they are determined by Congress as part of a broad policy which gives effect to considerations of well-being different from the objectives and tests of sound commercial practice. Furthermore, the Post Office—as the contractor for, and seller of, mail service—has costs of its own and performs classes of service other than air mail. It is entitled to apportion its costs and profits in the light of its own aims and policies, as defined for it by Congress.

Accordingly, the future service rate for the period on and after January 1, 1951, was based upon the cost of mail transportation of the Big Four carriers for the year 1950, with due consideration being given to major factors likely to influence the trend in mail cost. This cost and the proper service mail rate were, moreover, based on the cost of transporting the mail in the regular combination service (that is, in aircraft carrying first-class passengers, express, freight, and mail).

The Board held that the Big Four constituted a homogeneous group for rate-making purposes and that, accordingly, it was appropriate to establish a group rate for them. The desirability of a uniform service mail rate had been clearly set forth by the Board in a previous mail rate case in which it stated the following:²⁴

²⁴ *American Airlines, Inc., Mail Rates*, 6 CAB 567, 571 (1945).

Moreover, it is not our intention, nor do we believe it would be in the public interest, to fix the service mail rate on a cost-plus basis by extending to all carriers a uniform or fixed rate of profit on the required investment irrespective of the level of the operating costs. Except for cost differences which are inherent in the type or character of service or in the area served and where therefore are applicable alike to all carriers of comparable size, there would appear to be little justification for variations in the service mail rate because of differences in carrier operating costs. The "service" as opposed to the "need" mail rate is not designed to meet the financial need of the individual carrier but rather it is intended to be fair and reasonable in terms of both the quality of the service and the reasonable and necessary costs under conditions of economical and efficient management. Also, a uniform service mail rate provides added incentive for increased operating efficiency by competitive performance as measured by the relation of its costs to the costs of other carriers rather than upon an allowable rate of return on the investment of each individual carrier.

In the latter part of November, 1953, the Post Office Department indicated it felt that in some instances it was paying a premium for air mail transportation service via one carrier when similar service was obtainable by another carrier at lower costs. This situation arose particularly between those points served by the airlines on a 45 cent per ton-mile mail rate and those receiving 53 cents per ton-mile, both on a service rate basis. Different air transportation charges also were assessed between the same cities because of differences in mileage. The Post Office Department determined to establish a policy that, when air mail service would not be impaired, it would use the carrier assessing the lowest air transportation charges authorized by the Civil Aeronautics Board for air mail transportation. The affected carriers²⁵ accordingly petitioned the Board²⁶ for a reduction in rate as between the pairs of cities served by them and by a member or members of the Big Four to whom the lower mail ton-mile rate was applicable. The Board permitted the adjustment asked for in order to prevent the possible diversion of important mail revenue from Braniff, Capital, Delta, and Western.²⁷

The above action of the Post Office Department pointed up the problems inherent in the methods, previously discussed, for determining the service mail rates for the domestic trunk-line carriers. Two conclusions seem obvious. First, the service rate for each group of domestic carriers is an average rate for the domestic systems of all carriers in the Group. Second, the fact that a carrier in Group II

²⁵ Capital Airlines, National Airlines, and Western Air Lines over their entire systems; Braniff Airways, Delta Air Lines and Northwest Airlines over their routes within the continental United States.

²⁶ CAB Docket Nos. 6462, 6465, 6474, 6475, 6473, 6466 (1953).

²⁷ CAB Order No. E-8146, March 2, 1954, Docket Nos. 6462, 6474, 6475, 6473.

(See Tables 27 and 28, pp. 248 and 249) has a different rate from a carrier in Group I or Group III (the 45-cent and 75-cent carriers), as between any selected pair of cities, has no bearing on the validity of the particular rate because the total rate is but an average. For example, it is obvious that the 45-cent rate for the Big Four carriers is not necessarily adequate for each and every segment, although it has constituted a fair and reasonable average rate for the domestic operations of these airlines as a group. Transportation of mail over short-haul, less dense segments is unquestionably more costly than the transportation of mail in bulk over transcontinental segments. Had rates been established for the Big Four on a segment-by-segment basis designed to yield the same dollars as the average 45-cent rate, it is clear that the rates between some pairs of points would have been in excess of 45 cents and others lower. Similarly, it is clear that, had a structure of differing rates for different cities or points been chosen for the 53-cent carriers, rates lower than 53 cents could have been fixed over various long-haul segments and that over short, less dense segments rates exceeding 53 would have been required.

On September 30, 1954, the Civil Aeronautics Board proposed a new formula, retroactive to April 1, 1954, for setting service mail rate payments for the 13 domestic trunk airlines. The objective was to develop a service mail rate structure which would produce a uniform rate for all air carriers serving any given pair of communities and thus overcome the defects of the system discussed above.²⁸ The new formula would utilize a so-called standard mileage basis on which to compute mail ton-miles. These standard mileages would be predicated on the shortest mileage flown in scheduled service by the short-line carrier between each pair of points. It was further proposed that the new service mail rate for each of the 13 domestic carriers to be a two-part rate consisting of a line-haul charge of 30.10 cents per mail ton-mile and a terminal charge per pound of mail enplaned, varying according to the class of station involved. The line-haul charge would be applied to the mail ton-miles transported, computed on the basis of standard mileages. The terminal charge, which is the rate applicable at the originating station, would be applied to the pounds of mail enplaned at each station. The Board estimated that this two-part rate would produce an average yield of 41.46 cents per mail ton-mile for the airlines to which it is applicable and, at the same time, would place the Post Office Department in the position of making like-payments for like-services.

²⁸ *Service Mail Rate Proceeding*, CAB Docket No. 6509 (1954).

Separating Mail Pay from Subsidy

Early in 1949 John F. Kennedy, a Representative in Congress from Massachusetts, introduced a bill²⁹ providing for the separation of subsidy from air mail pay. Other similar bills were introduced in the Senate and the House, and extensive hearings were held.³⁰ A separation of subsidy payments from payments for carrying air mail was felt to be a pressing need. The first, and perhaps most fundamental, objective of such a separation would be to obtain some measurement of the commercial self-sufficiency in the air transportation system and of the various component parts of the system or, conversely, to obtain a reasonably accurate judgment of the amount and location of necessary government support for airline operations. Such a gauge seemed necessary in order that taxpayers might appraise the public cost of the air transportation system; in order that the airline industry might know which segments and services were not yet self-sufficient and better assess the progress these were making toward self-sufficiency; and in order that the Civil Aeronautics Board might appraise the commercial results so far achieved (as well as those they might fairly expect to be achieved) and determine whether certain marginal carriers should or should not be continued in operation.

The second fundamental objective of separation was to attain a more rational system of government accounting. The Post Office Department had for some years taken the position that it should not bear the full cost of developing air transportation. So long as subsidy was blanketed into the Post Office accounts and appropriations, neither the Department nor any other branch of the government, either legislative or executive, was able to distinguish the amounts which were properly chargeable to the mail service from amounts properly chargeable to other purposes, including the promotion of commerce and the national defense. Furthermore, the inability to measure airline subsidy, inherent in the system of payment which had so far been used, made it impossible for the government to measure the total cost of supporting aviation development.

The first subsidy separation bill proposed two things. Any subsidy which was included in payments to the airlines for transporting mail

²⁹ House Resolution 2908, February 21, 1949.

³⁰ "Air-Mail Subsidies," *Hearings before a Subcommittee of the Committee on Interstate and Foreign Commerce, House of Representatives* (81st Cong., 2d sess.) (1950); "Separation of Air Mail Pay from Subsidy," *Hearings before the Committee on Interstate and Foreign Commerce, United States Senate* (82d Cong., 1st sess.) (1951); "Air Mail Subsidies," *Hearings before the Committee on Interstate and Foreign Commerce, House of Representatives* (82d Cong., 2d sess.) (1952).

was to be stated separately so that the amount of the subsidy would be known. Second, responsibility for paying the subsidy, and securing the appropriations for it from Congress, was to be transferred from the Post Office Department to the Civil Aeronautics Board. Soon after the original bill was introduced, however, various conditions and riders were added to the proposal and other bills were introduced so that it was not long before the basic proposal, which had been generally favored, was virtually buried under an accumulation of complicated and controversial provisions, none of them essential, and many only remotely related to subsidy separation. Controversy over the fringe provisions delayed and eventually defeated efforts to enact subsidy separation legislation in 1950, 1951, and 1952.

The next step was taken on June 1, 1953, when President Dwight D. Eisenhower submitted Reorganization Plan No. 10 of 1953 to Congress under the provisions of the Reorganization Act of 1949, as amended.³¹ The plan went back to the fundamental problem and provided for the separate payment of airline subsidies, in order to place responsibility for such payment in the agency which determines them, the Civil Aeronautics Board, and to enable Congress and the President to maintain effective review of the subsidy program. Reorganization Plan No. 10 was adopted by Congress and became effective October 1, 1953. It transferred from the Postmaster General to the Civil Aeronautics Board responsibility for that portion of air mail payment related to subsidy assistance.

The plan for air mail payment now in effect does not alter the basic national policy of promoting the sound development of air transportation through federal aid. Nor does it, of itself, change the total amount of revenue for which any airline is eligible. It recognizes, too, that continued subsidy support will be necessary for some time if certain segments of the industry are to achieve the full measure of growth required by the public interest. In accordance with existing policy standards of the Civil Aeronautics Act of 1938, the Civil Aeronautics Board continues to determine the over-all level of payments to be made to the airlines for carrying mail, but the Post Office Department is responsible for paying only that portion which compensates for carrying the mail on the basis of fair and reasonable rates, determined by the Board without regard to the need for federal aid. The Board itself is responsible for paying any amounts in excess of such compensation, this excess being the subsidy element of the total federal payment.

³¹ House Resolution 264, H. Doc. 160, 83rd Cong., 1st sess.

Pursuant to Reorganization Plan No. 10, the Board in September, 1953, issued an order establishing the service mail rates to be paid by the Postmaster General to all certificated air mail carriers, effective October 1, 1953.³² This order represented the first formal separation of the compensatory and subsidy components in the mail rates for all of the certificated air mail carriers. In addition, in September, 1953, the Board released the annual revision of its "administrative report," separating service mail pay from subsidy and reflecting all final mail rates established by the Board since the release of its first report on the subject.³³ It may be considered as typical of all such reports and is used in this Chapter for illustrative purposes. This report contained estimates for fiscal years 1954-55 and actual data for 1951-53 and is summarized in Table 26.

In approaching the problem of administrative separation, it was necessary for the Board to determine a sound basis for determining rates to be paid the various air carriers for their service in carrying the mail. A service rate, as has been explained before, is one which compensates the air carriers for carrying the mail, reimbursing them for the related costs, including a fair return on the investment which is used in the mail service.

As previously noted, the Civil Aeronautics Board in 1951 established a service rate of 45 cents per mail ton-mile for the Big Four (American, Eastern, TWA, and United), based upon a detailed study of the costs of the mail service. This was the first service rate established by the Board during the postwar period and is the only service rate which has been fixed as the result of a comprehensive cost study.

In order to develop the service mail rates for the other domestic air carriers, it was necessary to adopt one of two courses of action: (a) to determine such rates on the basis of a detailed costing of the mail service for each carrier, or (b) to determine such rates by the use of an over-all statistical approach, without costing the mail service for each carrier.

The Board concluded that the statistical approach would permit the expeditious completion of a satisfactory study for administrative separation of mail pay. The detailed costing of the mail service for each carrier, on the other hand, would have required a large staff and an extended period of time.

³² CAB Order No. E-7721. The 1955 budget estimate for the Civil Aeronautics Board totaled \$76,777,000, of which \$3,777,000 was for expenses of the Board and the balance of \$73,000,000 for subsidy payments.

³³ The CAB has issued the following administrative separation studies: September 1951, June 1952, October 1952 (Revision), September 1953, September 1954, February 1955.

TABLE 26

DIVISION OF MAIL PAY BETWEEN SERVICE MAIL PAY AND SUBSIDY
BY GROUPS OF CARRIERS AND THE INDUSTRY AS A WHOLE

	FISCAL YEARS				
	1951	1952	1953	1954	1955
SERVICE MAIL PAY (000)					
Domestic trunks	\$ 25,432	\$ 31,743	\$ 32,355	\$ 34,631	\$ 36,370
Local service	1,151	1,139	1,136	1,382	1,425
Helicopters	907	862	1,876	341	353
International, overseas and territorial	17,006	17,775	18,605	19,716	20,312
Total	<u>\$ 44,496</u>	<u>\$ 51,519</u>	<u>\$ 53,972</u>	<u>\$ 56,070</u>	<u>\$ 58,460</u>
SUBSIDY (000)					
Domestic trunks	\$ 18,881	\$ 6,283	\$ 4,210	\$ 3,581	\$ 3,566
Local service	17,057	18,938	21,952	23,895	23,841
Helicopters	*	*	*	2,325	2,563
International, overseas and territorial	39,263	45,338	49,546	50,854	50,282
Total	<u>\$ 75,201</u>	<u>\$ 70,559</u>	<u>\$ 75,708</u>	<u>\$ 80,655</u>	<u>\$ 80,252</u>
TOTAL MAIL PAYMENTS (000)					
Domestic trunks	\$ 44,313	\$ 38,026	\$ 36,565	\$ 38,212	\$ 39,936
Local service	18,208	20,077	23,088	25,277	25,266
Helicopters	907	862	1,876	2,666	2,916
International, overseas and territorial	56,269	63,113	68,151	70,570	70,594
Total	<u>\$119,697</u>	<u>\$122,078</u>	<u>\$129,680</u>	<u>\$136,725</u>	<u>\$138,712</u>
PER CENT SUBSIDY TO TOTAL MAIL PAY					
Domestic trunks	42	16	11	9	7
Local service	93	94	95	94	94
Helicopters	*	*	*	80	87
International, overseas and territorial	69	71	72	72	71
Industry as a whole	62	57	58	58	57

* Until 1954 the total paid helicopter operators was considered service mail pay.

Source: Adapted from CAB *Administrative Separation of Subsidy from Total Mail Payments to United States Carriers*, September, 1953, Revision (Washington, D.C., 1953).

Study over a period of years has shown that the unit costs of an air carrier respond directly to the following primary operating factors: (a) length of traffic haul and average distance between stops; (b) density of traffic; and (c) volume of operations.³⁴ The Board determined, after extensive analysis, that revenue ton-miles per station was the most representative single measure which would reflect the combined impact of these operating factors on attainable cost

³⁴ For example, an air carrier which is required to stop every 50 miles to pick up ten pounds of mail and express and three passengers will have a much higher unit cost than an air carrier which stops every 300 miles and, at each such stop, picks up 150 pounds of mail and express and ten passengers.

levels. Revenue ton-miles per station were obtained for each carrier by dividing the revenue ton-miles flown during the fiscal year 1951 by the average number of stations served during this period. While there are other measures which may reflect particular operating characteristics with varying degrees of accuracy, the studies of the Board's staff have indicated that revenue ton-miles per station is the best available composite measure. It does not necessarily follow, however, that air carriers transporting the same ton-miles per station will have identical operating costs in any given year, since costs are affected directly by such factors as management efficiency, types of aircraft utilized, and various short-run factors, such as adverse weather, strikes, accidents, and groundings. Since the preponderance of air carrier costs is common to all classes of traffic, the cost of carrying the mail will tend to parallel the cost of all traffic combined. Therefore, it is possible to determine a service rate for each individual carrier by applying the percentage relationship of its costs to the average cost of the Big Four to the \$0.45 service rate of the Big Four.

The Board, however, rejected the individual carrier approach in favor of carrier groups, because such grouping permits the averaging of costs and thus tends to minimize deviations between the reported costs of the carriers. In addition, the establishment of groups is desirable from the standpoint of simple presentation. Accordingly, seven domestic air line groups were set up, as shown in Table 27, for the actual 1953 conditions and those predicted for 1955, as shown in Table 28. Seven international overseas and territorial groups of air carriers were also set up. The Board outlook for these groups is shown in Table 29.

The service rate for each carrier group was determined as follows:

1. The reported costs per revenue ton-mile for each carrier for the fiscal year 1951 were compiled from the periodic financial reports (Form 41) filed with the Board. These costs were adjusted to: (a) reflect standard depreciation allowances for flight equipment; (b) eliminate the cost of passenger service, traffic and sales, and advertising and publicity, which are essentially nonmail functions.
2. The reported costs for each carrier in each group were averaged to obtain the group cost per revenue ton-mile.
3. The percentage relationship of the average cost for each group to the average cost of the Big Four was then computed.
4. The service rate for each group was determined by applying the percentage relationship of each group to the 45-cent service rate established for the Big Four.

TABLE 27
DOMESTIC AIR CARRIERS
SEPARATION OF SERVICE MAIL PAY AND SUBSIDY
(Fiscal Year 1953)

CARRIER GROUPING	GROUP SERVICE RATE*	MAIL TON-MILES (000)	SERVICE MAIL PAY (000)	SUBSIDY (000)	TOTAL MAIL PAY (000)
GROUP I					
American.....	\$0 45	17,449	\$ 7,852	...	\$ 7,852
Eastern.....		5,773	2,598	...	2,598
Trans World.....		11,201	5,040	...	5,040
United.....		20,644	9,290	...	9,290
Total Group I.....		55,067	\$24,780	...	\$24,780
GROUP II					
Braniff.....	.53	1,921	\$ 1,071	\$ 698	\$ 1,769
Capital.....		2,077	1,101	...	1,101
Chicago and Southern (10 Mos.).....		714	378	334	712
Delta (Includes C & S 2 Mos.).....		2,117	1,122	...	1,122
National.....		1,434	760	...	760
Northwest.....		3,396	1,800	...	1,800
Western.....		1,462	775	...	775
Total Group II.....		13,121	\$ 7,007	\$ 1,032	\$ 8,039
GROUP III					
Colonial.....	.75	144	\$ 108	\$ 772	\$ 880
Continental.....		478	359	757	1,116
Northeast.....		135	101	1,649	1,750
Piedmont.....		95	71	1,564	1,635
Pioneer.....		126	95	1,042	1,137
Total Group III.....		978	\$ 734	\$ 5,784	\$ 6,518
GROUP IV					
Frontier.....	91	105	\$ 96	\$ 2,919	\$ 3,015
Mohawk.....		34	31	823	854
Southwest.....		86	78	922	1,000
Total Group IV.....		225	\$ 205	\$ 4,664	\$ 4,869
GROUP V					
Allegheny.....	1.48	64	\$ 95	\$ 1,860	\$ 1,955
Bonanza.....		24	36	728	764
North Central.....		101	149	2,301	2,450
Ozark.....		43	64	2,111	2,175
Southern.....		82	121	1,867	1,988
Trans-Texas.....		69	102	1,558	1,660
West Coast.....		35	52	1,563	1,615
Total Group V.....		418	\$ 619	\$11,988	\$12,607
GROUP VI					
Central.....	2.58	37	\$ 95	\$ 1,605	\$ 1,700
Lake Central.....		17	44	806	850
Total Group VI.....		54	\$ 139	\$ 2,411	\$ 2,550
GROUP VII					
Wiggins.....	7.26	1	\$ 7	\$ 283	\$ 290
Total Excluding Helicopters.....		69,864	\$33,491	\$26,162	\$59,653
HELICOPTER GROUP					
Helicopter Air Service.....		30	\$ 516	...	\$ 516
Los Angeles.....		48	660	...	660
New York.....		21	700	...	700
Total Helicopter Group.....		99	\$ 1,876	...	\$ 1,876
Total Including Helicopters.....		69,963	\$35,367	\$26,162	\$61,529

* Per ton-mile.

Source: CAB *Administrative Separation of Subsidy from Total Mail Payments to United States Air Carriers*, September, 1953, Revision (Washington, D.C., 1953).

TABLE 28
DOMESTIC AIR CARRIERS
SEPARATION OF SERVICE MAIL PAY AND SUBSIDY
(Fiscal Year 1955)

CARRIER GROUPING	GROUP SERVICE RATE*	MAIL TON-MILES (000)	SERVICE MAIL PAY (000)	SUBSIDY (000)	TOTAL MAIL PAY (000)
GROUP I					
American	\$0.45	19,830	\$ 8,924	.....	\$ 8,924
Eastern		6,560	2,952	.....	2,952
Trans World		12,250	5,513	.....	5,513
United		23,500	10,575	.....	10,575
Total Group I		<u>62,140</u>	<u>\$27,964</u>	.....	<u>\$27,964</u>
GROUP II					
Braniff . . . . .	.53	2,170	\$ 1,150	\$ 500	\$ 1,650
Capital		2,300	1,219	.....	1,219
Delta		3,200	1,696	.....	1,696
National		1,600	848	.....	848
Northwest		3,830	2,030	.....	2,030
Western		1,600	848	.....	848
Total Group II		<u>14,700</u>	<u>\$ 7,791</u>	<u>\$ 500</u>	<u>\$ 8,291</u>
GROUP III					
Colonial . . . . .	.75	154	\$ 116	\$ 764	\$ 880
Continental		505	379	687	1,066
Northeast		160	120	1,615	1,735
Piedmont		115	86	1,549	1,635
Pioneer		155	116	1,021	1,137
Total Group III		<u>1,089</u>	<u>\$ 817</u>	<u>\$ 5,636</u>	<u>\$ 6,453</u>
GROUP IV					
Frontier . . . . .	.91	122	\$ 111	\$ 2,904	\$ 3,015
Mohawk		51	46	954	1,000
Southwest		102	93	1,107	1,200
Total Group IV		<u>275</u>	<u>\$ 250</u>	<u>\$ 4,965</u>	<u>\$ 5,215</u>
GROUP V					
Allegheny	1.48	82	\$ 121	\$ 1,789	\$ 1,910
Bonanza		29	43	902	945
North Central		130	192	2,508	2,700
Ozark		62	92	2,008	2,100
Southern		97	144	1,810	1,954
Trans-Texas		83	123	2,577	2,700
West Coast		42	62	1,553	1,615
Total Group V		<u>525</u>	<u>\$ 777</u>	<u>\$13,147</u>	<u>\$13,924</u>
GROUP VI					
Central	2.58	46	\$ 119	\$ 1,686	\$ 1,805
Lake Central		30	77	1,473	1,550
Total		<u>76</u>	<u>\$ 196</u>	<u>\$ 3,159</u>	<u>\$ 3,355</u>
Helicopter Air Service		33	\$ 85	\$ 431	\$ 516
Los Angeles		54	139	761	900
New York		50	129	1,371	1,500
Total Helicopters		<u>137</u>	<u>\$ 353</u>	<u>\$ 2,563</u>	<u>\$ 2,916</u>
Total Group VI		<u>213</u>	<u>\$ 549</u>	<u>\$ 5,722</u>	<u>\$ 6,271</u>
Total Excluding Helicopters		<u>78,805</u>	<u>\$37,795</u>	<u>\$27,407</u>	<u>\$65,202</u>
Total Including Helicopters		<u>78,942</u>	<u>\$38,148</u>	<u>\$29,970</u>	<u>\$68,118</u>

* Per ton-mile.

Source: CAB *Administrative Separation of Subsidy from Total Mail Payments to United States Air Carriers*, September, 1953, Revision (Washington, D.C., 1953).

TABLE 29

U.S. INTERNATIONAL, OVERSEAS AND TERRITORIAL AIR CARRIERS
SEPARATION OF SERVICE MAIL PAY AND SUBSIDY
(Fiscal Year 1955)

CARRIER GROUPING	GROUP SERVICE RATE*	U S MAIL TON-MILES (000)	SERVICE MAIL PAY (000)	SUBSIDY (000)	TOTAL U.S. MAIL PAY (000)
A. TRANS-ATLANTIC OPERATIONS					
PAA-Atlantic.....	\$0 85	6,449	\$ 5,482	\$ 8,018	\$13,500
Trans World		4,869	4,139	4,361	8,500
Total Group A...		11,318	\$ 9,621	\$12,379	\$22,000
B. LATIN AMERICAN OPERATIONS					
Group B-1:					
PAA-LAD.....	.59	3,440	\$ 2,030	\$11,170	\$13,200
Group B-2					
Braniff.....	.88	643	\$ 566	\$ 2,934	\$ 3,500
Delta		69	61	739	800
Panagra.....		394	347	2,155	2,502
Total Group B-2..		1,106	\$ 974	\$ 5,828	\$ 6,802
Group B-3					
Caribbean-Atlantic.....	1.38	16	\$ 22	\$ 141	\$ 163
Total Group B.....		4,562	\$ 3,026	\$17,139	\$20,165
C. TRANS-PACIFIC OPERATIONS					
Northwest.....	.67	1,515	\$ 1,015	\$ 3,927	\$ 4,942
PAA-Pacific.....		5,328	3,570	7,823	11,393
Total Group C.....		6,843	\$ 4,585	\$11,750	\$16,335
D. HAWAIIAN OPERATIONS					
Hawaiian.....	.81	38	\$ 31	\$ 583	\$ 614
Trans-Pacific		21	17	453	470
Total Group D.....		59	\$ 48	\$ 1,036	\$ 1,084
E. STATES-ALASKA OPERATIONS					
Alaska Airlines.....	.47	260	\$ 122	\$ 1,174	\$ 1,296
Pacific Northern..		490	230	759	989
PAA-Alaska.....		525	247	1,322	1,569
Total Group E.....		1,275	\$ 599	\$ 3,255	\$ 3,854
F. INTRA-ALASKA OPERATIONS					
Group F-1:					
Alaska Airlines.....	1.29	275	\$ 355	\$ 969	\$ 1,324
Northern Consolidated		200	258	1,088	1,346
Pacific Northern.....		223	288	425	713
Wien.....		234	302	1,198	1,500
Total Group F-1.....		932	\$ 1,203	\$ 3,680	\$ 4,883
Group F-2:					
Alaska Coastal.	2.50	45	\$ 113	\$ 329	\$ 442
Byers.....		8	20	47	67
Cordova..		14	35	332	367
Ellis.....		18	45	254	299
Reeve.....		106	265	38	303
Total Group F-2.....		191	\$ 478	\$ 1,000	\$ 1,478
Total Group F.....		1,123	\$ 1,681	\$ 4,680	\$ 6,361
G. INTERNATIONAL "STUB-END" OPERATION OF DOMESTIC CARRIERS					
Group G-1:					
American (to Mexico) .....	.45	200	\$ 90	.....	\$ 90
Eastern (to Puerto Rico).....		548	247	.....	247
United (to Hawaii).....		842	379	.....	379
Total Group G-1.....		1,590	\$ 716	.....	\$ 716
Group G-2:					
National (to Cuba).....	.53	36	\$ 19	.....	\$ 19
Group G-3:					
Colonial (to Bermuda).....	.75	22	\$ 17	\$ 43	\$ 60
Total Group G.....		1,648	\$ 752	\$ 43	\$ 795
Total All Groups.....		26,828	\$20,312	\$50,282	\$70,594

* Per ton-mile.

Source: CAB *Administrative Separation of Subsidy from Total Mail Payments to United States Air Carriers*, September, 1953, Revision (Washington, D.C., 1953).

The separation of subsidy from total mail payments for a particular fiscal year was determined as follows:

1. The amount of service mail pay was computed for each carrier by multiplying the applicable group service rate by the actual mail ton-miles carried during the fiscal year.
2. The subsidy mail pay was computed by deducting the service mail pay, as calculated in (1) above, from the total mail pay for each carrier of the fiscal year.

As will be noted in Table 26, the percentage of subsidy to total mail payments is substantially greater for the international airlines as a group than for the domestic trunk lines. It is expected that the level of subsidy support for international operations of United States air carriers will tend to increase over the next several years, for the following reasons: (a) The competition of foreign-flag air carriers is constantly increasing³⁵ and the need to meet growing competition requires the United States international carriers to replace their existing aircraft with those having the latest technological improvements. (b) Although there has been an increase in the total international operations of all United States-flag airlines, this increase has been accompanied generally by a proportionate increase in operating costs. This differs from the domestic air carrier industry, where the increase in operating volume has been accompanied generally by a decline in unit operating costs. (c) The Territory of Alaska is a major beneficiary of the subsidy program³⁶ and will continue to need an increasing funds, because of the impact of inflation and the necessity for modernizing equipment and facilities. Without this subsidy air transportation, in some areas the only means of transport within the Territory, would virtually cease. (d) The national interests of the United States, including both the foreign commerce and national defense, result in the operation of some foreign routes for other than purely economic considerations. The aircraft and crews of the international carriers play a prominent part in current defense planning.

As in the case of the domestic airlines, the Board believed that the most reasonable means of separating service mail pay from subsidy for the international lines was to base this separation upon the cost of carrying the mail, including a fair return on the investment which is

³⁵ For example, in the calendar years 1949-51, the percentage of total North Atlantic area passengers carried by United States-flag airlines was: 1949, 67.6 per cent; 1950, 62.8 per cent; 1951, 57.4 per cent.

³⁶ In 1952, for example, air carriers operating within Alaska and between the United States and Alaska required subsidy support in excess of \$5 million, or 11.4 per cent of the total international subsidy requirements.

used in the mail service. The Board further believed that the techniques of separation should be basically the same for both international and domestic air carriers, and that there was no sound principle for differentiating between them. It was recognized that carriers engaged in international air transportation are faced with many unusual problems not confronting domestic carriers, but the combined impact of these unusual problems is reflected in the international carriers' operating costs. The steps followed in establishing the service rates for international air carriers were:

1. The carriers were grouped by geographic areas to allow for variations in political-economic conditions and operational differences.
2. The so-called "stub end"³⁷ operations of domestic carriers were treated as extensions of the domestic system and, therefore, were assigned the same service rate as those systems.
3. Within geographic areas, carriers (except the intra-Alaskan carriers) were grouped on the basis of revenue ton-miles per station, following the same principles applied to the domestic airlines.
4. Due to the prevalence of flag-stop and "bush" operations, stations other than a few major points could not be clearly defined for intra-Alaskan carriers, and consequently these carriers were grouped by total revenue ton-miles rather than revenue ton-miles per station.
5. The cost per revenue ton-mile for each carrier was determined from its reports to the CAB, after eliminating costs of nonmail functions (passenger service, traffic and sales, and advertising and publicity). Flight equipment depreciation allowances were based on standard rates and uniform amounts for each equipment type.
6. The average revenue ton-mile cost was computed for each group.
7. The cost per revenue ton-mile did not include return on investment, provision for income taxes, or any of the special cost aspects of the mail service such as priority considerations. To allow for these elements, the service rate was derived for each group as follows:
 - a) The percentage relationship of the average cost for each group to the average cost of 34.20 cents for the Big Four domestic carriers was computed.
 - b) The service rate for each group was determined by applying the percentage relationship for each group to the 45-cent service rate established for the Big Four.³⁸

³⁷ The "stub ends" are the operations of American Airlines to Mexico; Colonial Airlines to Bermuda; Eastern Air Lines to Puerto Rico; National Airlines to Cuba; and United Air Lines to Hawaii. Trans-border operations terminating in Canada were included in the domestic subsidy separation study.

³⁸ In arriving at the 45-cent service rate in the Big Four mail rate proceeding, the Board included an 8 per cent return on the investment devoted to the mail service, including an allowance for related federal income taxes. In addition, freight and express were treated as by-products in order to recognize the priority nature of mail. It should be noted that the cost of 34.20 cents for the Big Four is an average operating cost for mail, passenger, express, and traffic combined, and does not reflect the return element nor the treatment of freight and express as by-products.

8. In basing the service rate for international carriers on the ratio of their costs to the Big Four, the Board followed the procedure adopted for making the administrative separation of subsidy from total mail payments for domestic carriers.
9. For a particular fiscal year the amount of service mail pay was computed for each carrier by multiplying the applicable group service rate by the reported mail ton-miles carried during the fiscal year. The subsidy was computed by deducting the service mail pay from the total mail pay for each carrier.

Table 26 shows that the air carriers with the highest per cent of subsidy to total mail pay are the local-service airlines. This will probably continue to be the case, since these airlines suffer a number of cost handicaps implicit in the nature of such operations and making the attainment of self-support very difficult. These are: (a) Very light average loads. (b) Relatively short hauls, with a substantial part of the ground and indirect costs remaining fixed with respect to the length of flight per departure so that costs per plane-mile are high. (c) Variability of the traffic carried, with sharp changes in traffic volumes daily as between schedules, directionally and seasonally. (d) Competitive diversion of traffic, particularly to the private automobile, over short distances.

Experimental Rates

On September 8, 1953, the Postmaster General filed petitions with the Civil Aeronautics Board requesting it to fix rates for the transportation of first class and other preferential mail between Washington and Chicago at 20.04 cents per mail ton-mile and between New York/Newark and Chicago at 18.66 cents per mail ton-mile on an "experimental basis" subject to the following terms and conditions:

(1) The movement by air of such mail shall be subject to the prior movement of all air mail, passengers and air express required to be transported by the carrier. In the event that any or all of such mail has not been dispatched by the carrier within such time period as may be established by the Post Office Department, the carrier shall notify the Department, and if the carrier or the Department so elects, such mail shall be returned by the carrier to the custody of the postal service at the place where the initial delivery was made, without penalty to the carrier.

(2) Any air carrier authorized to transport such mail at the aforesaid rates may decline to inaugurate service at such rates, or, after inaugurating service, may, upon 30 days' notice in writing to the Post Office Department, decline to carry such mail at such rates on and after the expiration of the 30 day period, in which event the air carrier shall be under no obligation in connection with the transportation of such mail at such rates.

(3) The Post Office Department may at any time, upon 30 days' notice

in writing to the carrier or carriers involved, discontinue completely the offering of such mail for movement by air between Washington and Chicago or New York/Newark and Chicago. Except as may be required in the interest of the expeditious movement of the mail, the Department shall not discontinue offering said mail to any one or more authorized carriers which are willing to transport it at the said rate, unless the Department discontinues completely the offering of any such mail to all such authorized carriers.

(4) Such rate shall terminate one year from the inauguration of the service to which it is applicable.³⁹

The Post Office Department considered the rates proposed to be reasonable since: (a) the air carriers would not be obligated to transport the special classes of mail specified at said rates; (b) the rates were applicable to traffic which would not otherwise be available to the air carriers; (c) the Post Office Department would be able to achieve greater efficiency and economy in its operations and this, in turn, would improve the mail service to the public; and (d) the air carriers would be able to utilize whatever unused capacity was available to their economic advantage and thereby improve their financial position.

All carriers authorized to transport mail by air before this time had operated under rates fixed pursuant to Section 406 of the Civil Aeronautics Act on the basis of a service which they were obligated to render at the request of the Postmaster General and which they had to accord highest priority. There was no intention on the part of the Post Office or the airlines to now open, or in any manner place in issue, the rates so fixed. It was simply requested that a separate order of limited duration be entered fixing rates for the transportation by air, on a space-available basis, of a class or category of mail which the carriers would be under no obligation whatever to transport unless they voluntarily inaugurated service, and which they could terminate by giving 30 days' notice. Furthermore, this proposed class of service would, in effect, have only such priority as the carriers wished to give it, the only limitation being that the Postmaster General must have returned to him any mail not dispatched within the time specified by him.

United Air Lines and American Airlines informed the Board that they were willing to start the experiment as soon as possible. The Board accordingly authorized the proposed mail rates to go into effect but made them applicable to all authorized carriers willing to provide the service between the points named, thus bringing Trans

³⁹ CAB Docket Nos. 6308, through 6317 (1953). The following airlines were affected: United, American, Trans World, Capital.

World Airlines and Capital Airlines into the operation. The Board stated:

Obviously, a class of mail service that does not enjoy the advantages of mail bearing air mail postage, which is transported under absolute obligation on the part of the carriers and under the highest priority, is entitled to a lower rate, but exactly how much lower is practically impossible to determine in the absence of any specific experience with that type of service. We can gather some indication of the proper rate from the assignment of costs we made to compensate for the type of air mail service now in effect and paid for under outstanding orders, and we get some aid from a consideration of the rates now in effect for property and passenger services. The cost of surface transportation of such mail submitted by the Postmaster General is also of help. While all of these considerations are not as sufficient as we would normally require, we find that in view of the relatively small impact upon the total operations of the carriers that might be involved in this limited experiment, the impossibility of securing adequate data before the experiment has progressed, the fact that United and American have indicated their willingness to go along, the substantial public interest to be served in the proper development of the new service, and the fact that the Postmaster General has reached an advanced stage of preparation for conducting the experiment, the rate proposed for this new class of mail service should be fixed as the fair and reasonable rate.⁴⁰

On December 11, 1953, 14 local-service airlines requested the Board to fix a fair and reasonable rate of compensation of 30 cents per mail ton-mile for the transportation of preferential mails (first class, newspapers, and special handling and special delivery parcel post) and other classes of mail (other than air mail and air parcel post) over their routes on an experimental space-available, voluntary, and non-priority basis⁴¹ during the Holiday season. The local-service carriers held that this rate would be economically advantageous and would be fair and reasonable compared with the revenue per ton-mile being received by the local-service airlines then handling air freight in volume. They also argued that it would permit the local-service airlines to utilize available and unused capacity and that the revenue derived from this lift would reduce their subsidy requirements. The main support for the requested rate of 30 cents per ton-mile was the fact that the local-service airline transporting the largest volume of freight had on file a cargo tariff providing for approximately the same revenue yield. No other cost data was submitted to support the level of the rate proposed.

⁴⁰ CAB Docket No. 6599 *et al.* (1954).

⁴¹ CAB Docket Nos. 6443 through 6456 (1953). The following airlines were affected: Allegheny, Bonanza, Central, Frontier, Lake Central, Mohawk, North Central, Ozark, Piedmont, Pioneer, Southern, Trans-Texas, West Coast.

The Board approved the 30-cent rate to be effective only through January 11, 1954, and stated:

Since this is a novel service which appears at present to be of limited duration, there seem to be little, if any, readily usable cost data that can be relied upon. However, it is obvious that the rate to be established here should be lower than the rate fixed for the transportation of priority air mail, which carriers are under compulsion to carry if tendered. Normally, the Board could not possibly establish fair and reasonable rates in response to petitions so meagerly supported. Nevertheless, we are dealing with an atypical situation where permission is requested to perform a service for a very limited period of time in order to expedite the delivery of Holiday mail; and the rate proposed herein is intended to do no more than meet the special situation before us. The granting of the carriers' petitions will have several beneficial purposes. It will (1) make available to the Postmaster General the facilities of the local service airlines for the transportation of Holiday mail; and (2) result in additional revenues which should reduce the carriers' subsidy requirements.⁴²

On January 11, 1954, the 14 local-service airlines asked the Board to continue the experimental rate of 30 cents per mail ton-mile until the end of the year, in order to enable the Post Office Department to: (a) experiment from time to time with the transportation of preferential and other classes of mail (other than air mail and air parcel post) over selected segments of the local-service carriers' routes; (b) permit the local-service carriers to transport such classes of mail where conditions of an emergency nature arise; and (c) allow immediate use of the facilities of the local-service carriers in situations where the Post Office Department determines that the classes of mail involved can be transported more economically through the use of such facilities. The Board permitted the requested extension and later extended all experimental mail rates for trunk-line and local-service carriers to September 30, 1955.

The next move of the Post Office Department in the "experimental rate" program was taken on February 5, 1954, when it requested the Board to make a 20.04 cent mail ton-mile rate applicable to first-class and other preferential mail (other than air mail and air parcel post) to be transported between (1) Washington and Jacksonville, Tampa, and Miami, and (2) Chicago and Jacksonville, Tampa, and Miami. It was also requested that a rate of 18.66 cents per ton-mile be made

⁴² As in the case of the service mail pay established by Order No. E-7721, issued pursuant to Reorganization Plan No. 10, the service mail compensation established is also payable in its entirety by the Postmaster General, whereas the Board is responsible for payment of that portion of the mail compensation, payable pursuant to Section 406 of the Act, which is in excess of the service mail payments. Accordingly the rate proposed does not increase the total compensation payable to each carrier under Section 406 of the Act.

applicable to the same type of mail to be transported between New York/Newark and Jacksonville, Tampa, and Miami.⁴³ The Board put these rates into effect until September 30, 1954 (later extended to September 30, 1955) with the following statement:

The aforesaid rates shall be applicable only to the transportation of first class and other preferential mail (other than air mail and air parcel post) by aircraft under the terms and conditions set forth above and shall not in any manner alter, modify, amend, revise, or place in issue the mail rates that have been established by prior orders of the Board or by subsequent orders applicable to air mail and air parcel post transported under absolute obligation and highest priority.

In the meantime, various air carriers who were not certificated to transport mail requested that they be exempted from the provisions of Title IV of the Civil Aeronautics Act to the extent necessary for them to participate in the so-called "one-year experiment" being conducted by the Postmaster General in shipping surface mail by air on a space-available basis between Washington and Chicago and New York and Chicago, and other like experiments that might be inaugurated. Thus far, only the carriers certificated for mail between these cities were participating in the experiment under the substantially lower rates previously discussed.⁴⁴ The Board ruled that it is empowered by Section 416(b) of the Civil Aeronautics Act⁴⁵ to authorize by exemption the transportation of mail by air carriers not holding certificates of public convenience and necessity. Furthermore, the Board found that it had the power to authorize by exemption the transportation of mail by such air carriers and to fix the compensatory rates for such services. The Board stated:

It becomes difficult to perceive why the Board's authority to exempt with respect to mail traffic should be so different from and more limited than it is with respect to non-mail traffic. The Act which we administer has been described as being as comprehensive a piece of legislation as exists in the public utility field. Viewed in this light we must critically examine a construction which would deny to the biggest single customer of the airlines, the Post-

⁴³ CAB Docket No. 6539 (1954). The airlines affected were Delta, Eastern, National. The rates referred to were those in effect between Washington and Chicago and Newark/New York and Chicago under Board Orders Nos. E-7737 and E-7736 dated September 21, 1953.

⁴⁴ CAB Docket Nos. 5551, 5553, 6325, 6333, 6334, 6335-6337 (1953).

⁴⁵ Section 416(b) in pertinent part provides that, "The Authority from time to time and to the extent necessary, may . . . exempt from the requirements of this title or any provision thereof, or any rule, regulation, term, condition, or limitation prescribed thereunder, any air carrier or class of air carriers, if it finds that the enforcement of this title or such provision, or such rule, regulation, term, condition, or limitation is or would be an undue burden on such air carrier or class of air carriers and is not in the public interest."

master General, any opportunity to have the subsidy-free supplemental services of non-certificated air carriers that may be made available to the most infrequent traveler or shipper.⁴⁶

Despite this contention of its rights to exempt, the Board decided that none of the carriers who did not already hold a certificate of convenience and necessity authorizing the transportation of mail were needed at this time to insure the success of the Post Office experiment.⁴⁷

On October 6, 1954, another move in the "experiment" was made when the Postmaster General requested the Board to fix a fair and reasonable service rate for the transportation of certain first class and other preferential mail (other than air mail and air parcel post) by aircraft in a large geographical area embracing major terminals and smaller points on the West Coast.⁴⁸ The Post Office Department stated that this additional type of experience would be helpful in reaching conclusions as to the success of their experimental air transportation of so-called "surface" mail.⁴⁹ A rate of 18.98 cents per ton-mile was proposed and shortly thereafter was approved by the Board.⁵⁰ The Board's approval was subject to the terms and conditions specified in the rate orders issued in connection with the experiments on the East Coast,⁵¹ which have been outlined previously.

The various "experiments" in carrying surface mail had from their start been viewed suspiciously by the railroads and motor carriers, although the rail carriers had waived their objection to the continuation of the experimental services started before that on the West Coast.⁵² Now, however, certain common carrier railroads petitioned to intervene, contending that the effect of continuing the experiment

⁴⁶ In a strongly worded dissenting opinion two members of the Board, Chairman Ryan and Member Gurney, expressed the position that "the Board's power to fix *any* rate for the carriage of mail, whether it is purely compensatory or subsidy mail pay is, by the language of Section 406, expressly limited to those cases in which the recipient of the mail pay qualifies as a 'holder of a certificate authorizing the transportation of mail by aircraft.'" The dissenters expressed the opinion that those words in Section 406 which empower and direct the Board to fix mail rates only for mail certificate holders "constitute an express limitation on the Board's rate-making powers—a limitation which the Board cannot exempt from the Act and which it is without power to disregard or alter." *Supra*.

⁴⁷ CAB Order No. E-7985, December 21, 1953.

⁴⁸ The points involved were: Seattle, Washington; Portland, Salem, Bend, Redmond, Eugene, Medford, and Klamath Falls, Oregon; San Francisco, Oakland, Sacramento, Stockton, Modesto, Merced, Salinas, Fresno, Visalia, Bakersfield, Los Angeles and San Diego, California.

⁴⁹ CAB Docket Nos. 6901 and 6881, Order No. E-8755 (November 9, 1954).

⁵⁰ CAB Docket No. 6901, Order No. E-8792 (November 30, 1954).

⁵¹ CAB Orders E-7736 and 7737, September 21, 1953; E-8114, February 17, 1954.

⁵² Waiver was filed by railroads on September 21, 1954, CAB Docket No. 6539.

would be substantial revenue losses which might require the removal of certain schedules from passenger service and possibly cause loss of employment to railroad workers. This intervention was denied by the Board with respect to the temporary mail rate, but was to be permitted when the final rate came under consideration.⁵³

In the meantime, on November 20, 1954, the directly affected railroads filed a complaint for declaratory judgment and injunctive relief in the United States District Court for the District of Columbia.⁵⁴ They requested that the Court find and declare the institution and conduct of the proposed air mail transportation service by the Postmaster General unlawful and beyond the authority granted to him by law, and that the Court enjoin him from instituting or conducting the proposed service.⁵⁵ On December 13, 1954, the injunction was denied, but the legal questions involved in the suit were still to be answered. On January 28, 1955, the Court ruled that while the Postmaster General had a right to make the experiment it "shall not be unduly prolonged." This raises the question of how long an experimental period may be and it might end by Congress making the decision.

The airlines, of course, favor the continuance of the experimental flying of first-class mail, despite the danger that doing so at reduced rates may well undermine the straight air mail rates as previously established by the Civil Aeronautics Board. These carriers hope that eventually there will be but one first-class rate of postage with all first-class mail going by air whenever time may be saved. So far the Post Office policy, from the day of the stagecoach on down, has effectively developed for this country one of the world's finest public services. The fact that we have such an excellent system of handling the many classes of mail, including both priority and nonpriority, is no reason why the Department should not experiment further in expediting the mail, just as they are constantly working to facilitate its

⁵³ CAB Order No. E-8792, *ibid.*

⁵⁴ *The Atchison, Topeka and Santa Fe Railway Co., Great Northern Railway Co., Northern Pacific Railway Co., Southern Pacific Railway Co. and Union Pacific Railroad Co. v. Arthur E. Summerfield*, Civil Action No. 4858-54.

⁵⁵ The railroad contention that the transportation of ordinary, three-cent, first-class mail by air is unlawful is based upon their interpretation of *Title 39 of the United States Code—The Postal Service*, 43 Stat. 805, 39 USC 462, 462a and 463a. "Read in conjunction Sections 462a and 463a expressly provide that the 'rate of postage on all' 'mailable matter being transported as mail by air within the continental United States' 'shall . . . be 6 cents for each ounce or fraction thereof.' Section 463a fixes the rate of 'postage on all domestic air mail' at '6 cents for each ounce or fraction thereof' and Section 462a defines domestic air mail 'to embrace all mailable matter being transported as mail by air within the continental United States.'"

assembly and distribution. The fact that the current two-class priority mail has been developed over many years and has become our established policy does not mean that further change and improvement is precluded. It may be that the experiments in flying so-called "surface" mail will show that the savings and over-all increase in expedition are not sufficient to justify a change at this time, but that is for the Post Office Department to decide. It should not be barred from obtaining the needed data on which to make the decision.

Mail Rate Problem

The more recent actions of the Post Office Department, the airlines, and the Board point to the need for a formal investigation of mail rates, including a careful survey of the level as well as the structure of compensating mail rates for all domestic trunk carriers in particular.⁵⁶ Some of the recent Board orders, previously discussed, have been in the nature of "piecemeal" and "makeshift" methods of dealing with the mail rate problem.

It is true that the mail rate structure based solely on costs served reasonably well as long as the Post Office Department was charged with the responsibility of making the subsidy mail payments to the airlines, but now that the Post Office Department is required to find the most economical method of getting air mail delivered, it seems apparent that the classified rate structure should be abandoned and a new one established in its place.

A conflict has resulted under Reorganization Plan No. 10 between the self-interest of the Post Office Department and the Board's classified rate-making policy. The Post Office's interest can be protected only by selecting the carrier with the lowest rates for the service it requires. If the Post Office is successful in protecting its self-interest, the air carriers have no choice but to meet the lowest rates on all competitive routes, with the result that a uniform rate will prevail for similar service performed. This is an economic aspect of rate-making that cannot be eliminated by a cost approach which, in fact, reflects only the producer's point of view. It follows that it is not possible to impose upon a user, free to make its own economic decisions, different prices for service by different producers simply because the cost of producers differ.

The Post Office Department cannot change the law under which it must operate. The Board, however, can change its policy of rate-

⁵⁶ See separate statement of CAB Member Lee attached to CAB Order E-8146, March 2, 1954, in Docket Nos. 6462, 6474, 6475 and 6473.

making, and it appears that this will best be accomplished by abandoning the classified rate structure, based solely upon cost, and adopting a uniform rate structure,⁵⁷ as previously discussed. It is hoped that this will establish the same price for the same service throughout the airline industry. Under the present system as it has developed, the basic ton-mile rate alone is either too high for the long-haul carriers or too low for the short-haul carriers. The Board, therefore, in an effort to adjust this difference has given the short-haul carriers higher ton-mile rates than the long-haul carriers, with the result that we have a number of different rates based upon the differences in the route systems of the carriers rather than upon the differences in service performed. There is such a wide variance between the route systems of the different carriers that even a classified rate structure is not entirely satisfactory as a fair basis for payment, since the extremes in any classified group must accept rates which are slightly less equitable to them than to those carriers in the same group with more nearly average route systems.

The intention of Congress with respect to rate making for the transportation of mail by air is reasonably clear. In order to prevent the Post Office Department from using its great volume of traffic to force the rates of the carriers to uneconomic levels, and in order to force the carriers to transport the mail at a fair price to the government, a quasi-judicial agency was given full power to make the rates which the carriers should charge and the government pay. The Civil Aeronautics Board's role in this process is not greatly different from that of a district court which fixes the fair value of a piece of land that the government wishes to condemn. It is not regarded as proper for the government to use extra-legal methods to compel settlement of such a case at a low figure, nor is it proper for the government to put such pressures on a carrier that it is forced to petition the Civil Aeronautics Board for a rate reduction.

⁵⁷ See proposals in *Service Mail Rate Proceeding*, CAB Docket 6509 (1954).

Chapter

9 * CIVIL AERONAUTICS BOARD POLICY—FREIGHT RATES AND PASSENGER FARES

WHILE a very large part of the time and effort of the Civil Aeronautics Board has been devoted to the consideration of air mail rates, it has also had to adopt certain policies concerning the other sources of airline revenue—freight and passenger traffic.

*Freight Rates*¹

Prior to 1944, no air freight rates had been published by the airlines. Property rates were all published by the Railway Express Agency under its contracts with individual airlines, by which they carried any “air express” provided them by that organization. The Civil Aeronautics Board, while it approves rate agreements between the Railway Express Agency and the airlines and requires the filing of air express tariffs, has never taken formal action on nor adopted a policy concerning air express rates although it has from time to time considered the relations between the Railway Express Agency and the airlines. (See Chapter 15.) In the latter part of 1944, however, American Airlines, acting independently of the other carriers, established for its own routes a new, lower-cost service which it designated as “air freight,” thus marking the first use of the term “freight” in connection with the transportation of property by air. Shipments moving under this service had a “deferred” status, with air express receiving preference in the event of fully loaded airplanes. Whereas

¹ See Harold W. Torgerson, “History of Air Freight Tariffs,” *Journal of Air Law and Commerce*, Winter, 1948; John H. Frederick, “American Air Cargo Development,” *Air Affairs*, Autumn, 1947.

air express rates at that time averaged 70 cents per ton-mile, rates under the first air freight tariff averaged approximately 44 cents per ton-mile, door-to-door, with a deduction made where the shipper or receiver provided his own pickup and/or delivery service. For some time, probably because the plans of most airlines to inaugurate freight services were postponed by the demands made upon them by World War II, American Airlines was the only carrier offering freight service at such low rates.

The tariffs filed by American Airlines established a system of class and specific commodity rates applicable within mileage blocks. These tariffs set a pattern which was largely followed by other airlines, such as Transcontinental and Western Air and Braniff Airways, when they inaugurated freight services in the latter part of 1945.² There was, however, one important departure from the American Airlines pattern in the Transcontinental and Western Air tariff. While American's tariff rates included pickup and delivery service, TWA's rates were on an airport-to-airport basis, with pickup and delivery charges quoted in a separate section of the tariff, a practice which has now become general. The Braniff Airways tariff was also similar to American's except that it introduced a more refined mileage block system which all of the certificated carriers adopted in the following months.

Early in 1946, United Air Lines filed its first freight tariff,³ establishing a single-class air cargo rate at a level of approximately 26½ cents per ton-mile, airport to airport,⁴ under which all items acceptable for air transportation were grouped in a single commodity class to which the rates named were applicable. The elimination of various classes of commodities was a considerable simplification over previous air freight tariffs, and this method subsequently became standard among the certificated airlines. Another important departure from previous tariffs was that on shipments weighing over 499 pounds the rate per 100 pounds decreased. As an illustration, graduated rates quoted by United Air Lines effective February 1, 1946, were:

² American's tariffs were Air Freight Classification No. 1, CAB No. AF-1, and Air Freight Tariff No. 1, CAB No. AF-2, both effective October 15, 1944. TWA's tariff was Air Freight Tariff No. 1, CAB No. AF-1. Braniff's tariff was Air Freight Tariff No. 2, CAB No. AF-2, effective December 1, 1945.

³ Air Freight Tariff No. 1, CAB No. AF-1, effective February 1, 1946.

⁴ There is no clear indication of the reasons for the abandonment of a classified rate structure in favor of a single rate. Presumably this represents, in part, the attitude that there was too little experience available at this early stage of the industry's development upon which to base a rate classification.

Weight Group (Lbs.)	Rate Basis per Ton-Mile	Percentage of 100-Lb. Rate
100-499	26.5¢	.
500-999	25.6	96.6
1,000-1,999	24.7	93.2
2,000-2,999	23.0	86.8
3,000 and over	21.2	80.0

The idea behind this move was to stimulate volume shipments and to make the air freight forwarder business attractive, with the result that a considerable number of companies entered this field almost at once.

Pennsylvania-Central Airlines (now Capital Airlines) filed its first freight tariffs in July, 1946, departing from the established pattern in several respects.⁵ The major difference was in a decrease in the size of mileage blocks to which rates applied, so that this company had a rate advantage over the other airlines, particularly between the principal freight traffic-generating points within its territory.⁶ Pennsylvania-Central also increased the reductions offered on quantity shipments weighing between 500 and 3,000 pounds, with the result that, with minor exceptions, all of its rates on quantity shipments were lower than those of competitors.

While the major airlines were launching their air freight services, a large number of new noncertificated carriers were organized and began to compete in the cargo field. (See Chapter 15.) Until August 1, 1947, these carriers were not required to file tariffs with the Civil Aeronautics Board, and so they were free to negotiate terms with individual shippers. There was considerable experimentation with rates; but very little of this experimentation was planned, most of it being dictated by force of circumstances—chiefly competition. There was no uniformity either among these newer cargo carriers or among one carrier and its shippers. Many rates were made as a result of bargaining between carrier and shipper and were dictated, more frequently than not, by the competition of the one-plane veteran operators who were consistently carrying loads at whatever the traffic would bear. For example, the average revenue per ton-mile flown by Slick Airways, one of the most important of the new operators, in the months of March, April, May, and June, 1947, was 20.1, 16.1, 17.5, and 13.6

⁵ Air Freight Rules Tariff No. 1, CAB No. 1; Air Freight Tariff No. 2, CAB No. 2; and Air Freight Tariff No. 3 (Terminal Area Directory), CAB No. 3, effective July 15, 1946. This company later changed its name to Capital Airlines.

⁶ Chicago-Detroit, Chicago-New York, and Pittsburgh-New York.

cents, respectively.⁷ The situation was chaotic but, as one looks back on it, probably inevitable.

The certificated airlines took various steps to meet competition from the noncertificated cargo carriers. In June, 1946, American Airlines established a Contract Air Freight Division, which operated independently of the common carrier freight division and at rates reported to be as low as 11 cents per ton-mile for transcontinental shipments.⁸ In an effort to reduce its handicap, United Air Lines added new weight groups and new rules covering accumulation and consolidation so as to make its services increasingly attractive to large shippers and freight forwarders.⁹ Pennsylvania-Central Airlines (now Capital Airlines) also liberalized its assembly and distribution service and provided for "shippers all-risk insurance," with coverage somewhat broader than that usually assumed by a common carrier.¹⁰

The next major development was the cancellation by the certificated airlines of their individually issued and outstanding general commodity tariffs and the filing with the Board of three Consolidated tariffs, concurred in by all of them, to become effective August 1, 1947.¹¹ The consolidated tariff provided an average rate of 20 cents a ton-mile, with a spread ranging from 33 cents a ton-mile for small packages moving short distances to 14 cents for planeloads of 16,000 pounds. The freight forwarders suffered from these new charges, which were set up so as to prevent the forwarders from profitably using the services of the certificated airlines by consolidating small shipments into larger lots, thus taking advantage of the rate differentials contained in previous individual airline tariffs.

When, in May, 1947, the Civil Aeronautics Board permitted the noncertificated cargo carriers to operate on a scheduled basis¹² as common carriers rather than to operate only upon an irregular or noncommon carrier basis, such operators were required to file tariffs and reports. The basic principle apparently underlying the cargo tariffs filed by the noncertificated operators in the summer and early

⁷ Economic Exhibit of Slick Airways, Inc., submitted to Civil Aeronautics Board in Docket No. 810 *et al.* (*Air Freight Case*), p. SA 354.

⁸ *American Aviation*, June 15, 1946, p. 24.

⁹ Supplements Nos. 1 and 2 to Air Freight Rules Tariff No. 1-A, CAB No. 4, effective 1946.

¹⁰ Supplements No. 1 and 2 to Air Freight Rules Tariff No. 1-A, CAB No. 4, effective February 15, 1947.

¹¹ Official Air Freight Rules Tariff No. 1, CAB No. 1; Official Air Freight Pickup and Delivery Tariff No. 1, CAB No. 3; Official Air Freight Tariff No. 1, CAB No. 2.

¹² See Chapter 6.

fall of 1947 was that their rates should, in order to develop traffic, and could, because of savings in operating and other costs, offer air cargo service at substantially less than the certificated airlines could afford to charge.

Some of the certificated airlines maintained that these tariffs represented an "under-cutting" or a rate-war "salvo" by the cargo operators, since the tariffs presented rates below those then current in the airline tariffs. Whether this was so, the fact remains that the all-cargo operators proceeded from the outset of their enterprises in the belief that they could "out-operate" the certificated airlines on cargo since the latter were still primarily concerned with the problems incident to their growing passenger traffic. The air cargo operators were convinced, from their studies of airline costs, that efficient air cargo lines which concentrated on low-cost, highly efficient, all-cargo operations could provide the public with air cargo service at rates not only lower than any of the passenger-carrying airlines had offered so far, but probably lower than they could charge on a basis of costs involved. It is true that the air cargo operators were probably prepared to have a few of the airlines meet their rates, on a basis of pure competition; but it is also true that none of them believed that the certificated airlines could or would be permitted to undercut the strictly air cargo operators' rates.

Shortly after the first of September, 1947, American Airlines, Pennsylvania-Central Airlines (now Capital Airlines), and United Air Lines, all in active competition with the noncertificated operators, proposed rates of approximately 12 cents a ton-mile on many of the chief commodities carried by air; on those constituting the major portion of the traffic of the all-cargo carriers,¹³ and between the most important cities served by both groups of carriers. These specific commodity tariffs provided rates generally lower than those of non-certificated operators and hurt the interests of freight forwarders, since the 100-pound rates of the certificated airlines were made equal to the rates in the 1,000–2,999-pound bracket of the leading all-cargo operators. The airline commodity tariffs did not reduce rates between

¹³ The tariffs were American Airlines, Inc., Air Freight Tariff No. 22, CAB No. 31; Pennsylvania-Central Airlines Air Freight Tariff No. 4, CAB No. 1; and United Air Lines, Inc., Air Freight Tariff No. 3, CAB No. 8. The application was to 100 pounds and heavier shipments of the following commodities to be transported between designated cities: agricultural and horticultural products (except cut flowers), aircraft and automobile parts and accessories, wearing apparel, drugs, dry goods, electrical appliances or parts, films, fresh fruit or vegetables, radios or radio parts, machines or machine parts, and telephone or telegraph instruments, parts, or supplies. The cities between which the new rates applied included Chicago, Detroit, Los Angeles, Newark, and New York.

points where no substantial cargo-operator competition existed, but were directed rather to the long-haul transcontinental routes. It was on these routes that the strictly cargo operators had been concentrating since the issuance of the Board's order exempting them from the need for certification as common carriers, pending decision on their applications for certificates of convenience and necessity.

It is not surprising that the freight forwarders and cargo operators raised the cry of "rate war" and requested the Board to suspend the specific commodity tariffs filed by American, Pennsylvania-Central, and United. This the Board refused to do on the grounds that the cargo operators had asked to be permitted to compete as common carriers with the certificated airlines and that the airlines were simply meeting competition by their latest rates; but, at the same time, it ordered an investigation of the tariffs of both certificated and uncertificated carriers. The goal of this investigation was "to attempt to develop some rational principles for tariff-making in air transportation as well as to inquire into the validity of the tariffs that have been filed."¹⁴

The Board was faced with the realization that the investigation would probably take some time; that in the meantime the low rates proposed by the commodity tariffs then on file, and others proposed by the rest of the certificated airlines during the month of October, 1947, would be in effect; and that the noncertificated carriers would therefore be rapidly forced out of business, since their rates had already reached the point where they couldn't hope to cover operating costs. The Board was really placed in a dilemma since it permitted mail rates averaging, for the larger carriers, between 45 and 60 cents a ton-mile and passenger rates averaging 50 cents a ton-mile. The question naturally arose as to whether such high mail rates and passenger fares were justified if the airlines could carry cargo at 12 cents a ton-mile. In other words, were the airlines being subsidized by air mail payments so as to enable them to force independent air cargo operators out of business? The Board, therefore, halted all rate reductions pending the investigation already ordered and suspended the tariffs in question.¹⁵

¹⁴ *Motions of Air Freight Forwarder Association et al.*, CAB Order, Serial Nos. E-852, E-853 (October 2, 1947).

¹⁵ By an order (Serial No. E-1016) dated November 20, 1947, the Board consolidated this and certain other investigations into one proceeding (Docket No. 1705 *et al.*) known as the Air Freight Rate Investigation. Hearings on this docket were begun February 2, 1948, and it was decided on April 21, 1948. The reason for such unusually rapid action on the part of the Board was that the Civil Aeronautics Act (sec. 1002 [g]) does not per-

The noncertificated cargo carriers asked the Board to do two things: (a) to adopt a regulatory scheme for air freight rates which would make it impossible for the passenger lines arbitrarily, and without reference to their costs of providing air freight service, to charge rates which were lower than those of strictly air freight carriers; and (b) to permit the air cargo operators to file new tariffs in the near future containing rates sufficiently higher than those presently offered in order to meet their increasing costs of service.

As the Board's investigation went on, the chief issue turned out to be the proper method of calculating the costs of a multiple-service (passenger, mail, and property) operator in rendering air cargo service. Everyone seemed to agree that, as a general proposition, air cargo rates should bear a "reasonable relation" to the cost of providing the service. Serious differences of opinion, however, existed between the air cargo operators and the scheduled airlines as to what formula would most nearly determine the "costs" to which airline cargo rates should bear a "reasonable relation."

The air cargo operators claimed that, in their case, no problem arose—their costs of providing service were the total costs of their business, since (with some exceptions) their sole business was air cargo service. They also contended, and rightly so, that their rates had to be sufficiently high to cover their costs of operation and to provide a reasonable margin of profit. The certificated airlines, on the other hand, were not entirely unanimous in their attitude toward computing their air cargo costs; but most of them took the position that their cargo costs were properly to be computed on an "additive cost" or "by-product" theory of accounting. They also pointed out that, if this theory was adopted, their air cargo costs were not only substantially below the rates published in any of their tariffs but generally below any that the air cargo operators could immediately hope to achieve.

The certificated airlines asked the Board not to be "diverted by false issues concerning the need of protection by the noncertificated cargo carriers," but to adopt a long-range approach to the development of cargo transportation by air and, above all, to reject any system of minimum rates because of the "hampering restrictions" which would thus be imposed on their operations. They also requested that the suspended tariffs be permitted to go into effect.

mit tariffs to be kept under suspension for longer than 180 days beyond the date they were originally intended to go into effect. See *Air Freight Rate Investigation*, 9 CAB 340 (1948).

Table 30 shows the trends of freight rates for various types of air carriers from 1949 through 1953. All-cargo carrier rates have consistently remained below those of the combination, domestic trunk,

TABLE 30
FREIGHT-RATE TRENDS, 1949-53

FISCAL YEARS ENDED JUNE 30	AVERAGE YIELD PER TON-MILE FOR ALL COMMODITIES (CENTS)					
	Domestic trunk	All-cargo	Local service	Inter-national	Territorial	
					Alaskan	Other
1949.	19.63	.....	29.77	42.54	....	54.24
1950.	19.41	15.88	31.24	36.41	....	55.72
1951.	19.67	14.90	31.10	36.06	....	48.43
1952.	21.06	15.40	34.73	35.59	59.22	44.92
1953.	22.09	16.23*	38.52	33.20	60.80	47.72
Index (1949 = 100)						
1949.	100.0	.....	100.0	100.0	....	100.0
1950.	98.9	.....	104.9	85.6	..	102.7
1951.	100.2	.....	104.5	84.8	.....	89.3
1952.	107.3	.....	116.7	83.7	.....	82.8
1953.	112.5	.....	129.4	78.0	..	88.0

* Includes preliminary data for Flying Tiger Lines, Inc.

Source: Civil Aeronautics Board, *Annual Report, 1953*.

airlines although both groups of rates increased during this five-year period.

Setting Minimum Freight Rates

In its investigation of air freight rates the Board found that an unsound competitive condition existed in the cargo phase of air transportation in this country. This was particularly true in the transportation of freight between the large cities, where a number of the airlines, as well as the cargo operators, had established rates that were unjustified economically with the result that some of the carriers were incurring substantial operating losses. In the judgment of the Board, therefore, the situation required promulgation of a general minimum-rate order, applicable to the entire industry, setting a floor below which no freight rate might go without approval of the Board. The following rates were therefore set: (a) a minimum rate of 16 cents per ton-mile covering the first 1,000 freight ton-miles of any shipment and (b) a minimum rate of 13 cents per ton-mile covering the ton-miles in excess of 1,000 for any shipment.¹⁶

¹⁶ *Air Freight Rate Case, 9 CAB 340 (1948)*.

In fixing general minimum rates, the Board avoided prescribing, establishing, or determining particular rates, rate structures, or levels of rates. It was felt that not only was the information gained as a result of the Board investigation inadequate for such purposes but also that, at the present state of development of air freight, the prescription of actual rates by regulatory action might well be so restrictive as to be extremely unwise. Of course, the fixing of general minimum rates, by its very nature, cannot assure profitable operation or guarantee the continued sound development of air freight. It does, however, do what the Board thought absolutely necessary at that time—prevent unlimited rate cutting on a purely competitive basis.

Some in the industry questioned the Board's wisdom in setting minimum rates so far below what appeared to be industry cost levels, but it must be borne in mind that the Board's rates represented the *minimum* and not the *actual* rates and gave recognition to the developmental character of the service.

The Board stated that it was not its intention to freeze rates in the early developmental period or to outlaw competitive rates, but merely to "prevent the financial stability of the industry from being imperiled by unrestricted competitive pressures which drive the rate structure generally to unremunerative levels." To provide for the possibility of developmental rates and to permit flexibility and experimentation, the Board stated that it would be "receptive" to petitions for exemptions from the minimum rates in particular instances where such exemptions are necessary to the proper development of air cargo to remove inequities or disparities within the rate structure.¹⁷

It is a truism in transportation that a regulated minimum rate in most cases becomes a maximum rate where route competition exists. Although the Board suggested that carriers set their rates above the minima prescribed, the direct competitive situation which exists on all major cargo routes provides a perfect set of circumstances for this rule again to prove itself. Certainly the Board's order and the circumstances surrounding its promulgation make clear that, at that time, air cargo rates were passing through a critical formative period, that the most intense competition prevailed among the carriers, and that the

¹⁷ On February 21, 1949, the Board instituted its Class Rate Investigation, Docket No. 3665, to determine whether it "should determine and prescribe just and reasonable class rates for the interstate transportation of freight by air carriers as the lawful rates, and if so, what class rates (or maximum or minimum, or the maximum and minimum thereof) should be demanded, charged, collected or received as the lawful rates." As of the end of 1954, this investigation had not been completed.

experience required to develop accurate cost determination methods had not yet been developed by either the Board, the certificated airlines, or the then noncertificated cargo carriers.

Since the minimum-rate order has been in operation, the all-cargo operators have continued to confine their activities to moving large shipments for long distances. Even after temporary certificates were granted them, they operated on even less than the proverbial "shoe-string" and had to follow only the most profitable courses. On the other hand, the airlines continued to encourage small, short-haul shipments in their combination equipment but with an increasing interest in the volume traffic which can be obtained, they hope, directly from shippers without forwarder intervention. (See Chapters 15 and 16.)

TABLE 31
COST OF "ALL CARGO" OPERATIONS, 1952-53
(In cents per available ton-mile, 12 months ended
June 30, 1953)

Carrier	Type Aircraft	Total Operating Expense
Flying Tiger Line	C-46	*13.09¢
Slick Airways	C-46	*14.58¢
Slick Airways	DC-6A	*17.52¢
American Airlines	DC-4	†12.13¢
Trans-World Airlines	DC-4	†14.15¢
United Air Lines	DC-4	†15.76¢

* Total operating expense.

† No attempt has been made to allocate scheduled combination carrier's overhead costs to the all-cargo service.

Source: CAB Docket 1705 *et al.* (1953).

On August 20, 1953, Slick Airways, Inc., filed a petition with the Board asking that minimum rates for air freight be increased by 25 per cent. The other most important all-cargo carrier, Flying Tiger Line, Inc., concurred in this request. The Board granted this increase, to become effective October 1, 1953.¹⁸ The grounds for the cargo carrying airlines' request were that the costs of carrying freight on all-cargo aircraft had risen sharply since 1948, when minimum rates were first set by the Board. Table 31 shows total cost including all ground and indirect expenses for the all-cargo carriers. It also shows

¹⁸ *Air Freight Rate Case*, CAB Docket No. 1705 *et al.* (1953). The Board called attention to the fact that a 25 per cent increase in minimum rates did not mean that there would be a like increase in actual rates charged. At the time the order was issued most rates were at least 10 per cent above the minimum rates, and many exceeded the minimums by even greater amounts. Accordingly, the requested 25 per cent increase in minimum rates would seldom force an effective rate increase exceeding 12 per cent, and in many cases the required increase would be less.

the flight costs, direct maintenance, depreciation of flight equipment, and ground and indirect maintenance costs allocated to aircraft types on the basis of direct labor charges for the latter, incurred in all-cargo operations by the three so-called "combination" airlines in direct, transcontinental competition with Slick and Flying Tiger. The fact that operating expenses in mid-1953 for all-cargo carriers were so close to the minimum rates previously set by the Board indicates that such minimums were probably no longer effective in preventing competition from holding rates below the cost of carriage in all-cargo planes.¹⁹ The action of the Board in granting the increases requested, over the objections of at least one of the "combination" airlines, American Airlines,²⁰ was unprecedented in the annals of rate regulation since the overriding and, indeed, only immediate considerations were that two of the experimental cargo carriers were conducting marginal operations and that Slick, in particular, had urgent need for prompt rate relief. The Board gave no consideration to such statutory rate-making factors as the effect of rates upon the movement of traffic, the public interest in having adequate and efficient transportation at the lowest cost consistent with furnishing such service, and the efficiency of carrier operations.

As time goes on, competition for large shipments probably will tend to be more on the basis of service to the shipper than on rates. Transportation history shows that "service" competition may employ measures which are just as destructive as those in "rate" competition and which become infinitely more difficult to control.

Setting Directional Freight Rates

An example of the Board's flexible treatment of the minimum freight rates set in 1948 is its handling of carrier requests for de-

¹⁹ Financial reports of the two major all-cargo carriers submitted to the Board along with the petition of Slick Airways in August, 1953, indicated that Flying Tiger was barely breaking even on their scheduled flight operations, while Slick appeared to be suffering substantial losses.

²⁰ American Airlines agreed that the costs of carrying air freight had risen sharply but took the position that since, in 1952, it was able to maintain a 68.3 per cent load factor in its all-cargo operations, yet carry 68.5 per cent of its cargo traffic in aircraft along with passengers, mail and express, it could, in using such aircraft, carry freight cheaper than the all-cargo carriers. Under such circumstances it argued that the Board should consider this factor in fixing minimum rates, thus being consistent with the position maintained by the combination airlines in all-cargo rate cases to date. American also pointed out that air freight was in a critical developmental stage with a critical need for volume growth; that volume had developed to a lesser extent than anticipated in 1948; that it was adding substantially to its all-cargo fleet; and that the increase in minimum rates proposed would not be consistent with the objective of developing the air freight volume required by the new capacity.

creases to encourage the development of directional or backhaul traffic. Between July 21, 1948, when the Board issued its minimum-rate order, and April 10, 1950, five supplemental rate orders modifying the minimum rates were issued. Some of these provided rates as low as 8 cents per ton-mile for quantity shipments. The order of April 10, 1950, was the most important, providing reductions for eastbound and northbound traffic, with the exception of certain commodities, as follows: Shipments in an easterly direction, not exceeding 650 miles, to take rates 100 per cent of the minima prescribed in July, 1948 (16 cents per ton-mile for the first 1,000 ton-miles and 13 cents per ton-mile for those in excess of 1,000 for any shipment); but shipments carried between 650 and 1,300 miles to take rates decreasing gradually from 100 per cent to 60 per cent of the present minima. For shipments moving 1,300 miles or more, the directional minima were to be 60 per cent of the present minimum rates. In recognition of the shorter distances from south to north as compared to those from west to east, the breaking points for the northerly routes were set at 550 and 1,100 miles, respectively.²¹

Air cargo carriers have a very serious backhaul problem. This is so because a much greater amount of freight is carried from east to west and from north to south than in the opposite directions. This unbalanced movement of freight results in a substantial amount of unused freight space on return flights from the west coast to the east coast and from the south to north. The variation between westbound and eastbound loads is largely because the average length of haul of westbound traffic is substantially greater than that of the eastbound haul. For example, during a typical month, freight tonnage leaving California moved on the average of 1,738 miles, whereas the movement of such tonnage destined for California averaged 2,220 miles. Also, the off-loading of eastward traffic at intermediate points without the enplaning of comparable loads, together with the failure to originate as much traffic from California as is unloaded there, results in low loads in the backhaul direction. The Texas and Florida backhaul problems are similar to that of the West Coast. In the case of Texas, the backhauls are westward from that state to California and northbound to the northeast and central areas. The directional disparity for Florida exists northbound from Florida to the northeast and central areas.

The directional problem has been further complicated by the fact that a large portion of the traffic in the off direction goes to inter-

²¹ *Air Freight Rate Investigation (Directional Rates)*, 11 CAB 228 (1950).

mediate points rather than to coastal terminal points. Lower directional rates were at first permitted by the Board on an experimental basis but later were placed on a permanent basis.²² Such rates help to meet the problem in two ways: (a) they stimulate the growth of long-haul traffic; and (b) they develop directional traffic at intermediate points, since, with increasing volume, the scheduling problem which limits the servicing of intermediate points by all-cargo aircraft is lessened.

The existence of unused space in the backhaul direction has a restrictive effect on the proper development of air freight in two important respects: (a) there is a substantial loss of revenue resulting from empty space in the backhaul direction, and (b) carriers restrict their operations in the heavy or going direction because of the backhaul problem in the reverse direction. The concentration of effort, in other words, is in trying to develop eastbound long-haul traffic. Were this same effort expended in the development of westbound traffic, a substantial increase in volume of that traffic would doubtless be experienced. Thus the problem results not only in the loss of revenue caused by excessive available space on return trips but in a loss in revenue from the nonrealization of the full freight potential at the rates then current in the predominant direction.

If air freight transportation is to become a self-sustaining business, it is essential that the revenue from its carriage in both directions be sufficient to cover the total cost of so doing. If traffic were carried in the forward direction at the minimum rates as prescribed in 1948 and in the off direction at lower than minimum rates, it seemed to the Board that it would not be possible to meet total costs. It was for this reason that the Board, in setting the original minima, stated that they were to be regarded as a "floor under which no rate should go" and that it "expected carriers to establish rates for most commodities above that floor in order to make the operation profitable." Instead, as already has been discussed, the carriers tended to establish rates for all commodities at or near the minimum levels. This will almost surely again be the case, and directional minima will tend to become the maximum rates.²³

²² *Air Freight Rate Investigation (Directional Rates)*, CAB Docket No. 1705 *et al.*, Consolidated (1952).

²³ The Board excluded the following commodities from the application of backhaul minimum rates since they had already moved in considerable quantities at prevailing rates: art works, cut flowers, gold coins and bullion, household goods, human remains, ladies' hats, live animals, negotiable securities, paper currency, personal effects, platinum and precious metals, and wearing apparel on racks or hangers.

In hearings prior to the issuance of its directional-rate order, the Board was advised by the combination passenger and cargo carriers that it would be best to do nothing ratewise, as a thorough sales effort on the West Coast would largely correct any unbalance. The Board, however, felt that the results of intensified sales efforts so far did not indicate that promotional programs alone could correct the existing unbalance and that, therefore, the most logical solution, offering the most reasonable prospects of success, was for the carriers to at least experiment with lower rates in the off direction.²⁴ The Board stated its belief, however, that rates in the backhaul direction should not be permitted to go below the minima based on out-of-pocket costs,²⁵ plus some contribution to other operating expenses but not necessarily assuming the fully allocated cost of handling the traffic.²⁶ This theory is apparently based on the facts that (a) since the movement of aircraft westbound makes available space in an eastbound direction, the round-trip movement must be regarded as an indivisible unit of operation, the costs of which must be compensated for by the charges for cargo moved in both directions, and that (b) to whatever extent there is available empty space, the increased burden of covering the costs of the round-trip operation should fall upon the freight that is moving. Therefore, the carriage of any freight that will yield additional revenues will contribute to the net revenue of the round-trip

²⁴ Another logically possible solution was to reduce the forward haul by increasing forward haul rates. The Board felt, however, that a general increase in westbound rates to equalize traffic movement would hamper the development of the full air freight potential and seriously limit operations. In addition, such an increase would be economically unsound since the burden of the costs would be increased to the remaining traffic. *Air Freight Rate Investigation (Directional Rates)*, 11 CAB 228 (1950).

It should be noted that there is no rule of law which requires that rates be the same in both directions. There is justification for the establishment of directional rates where transportation conditions are substantially different. An examination of the cases decided by the Interstate Commerce Commission reveals that the carriers have been permitted to establish reduced rates to encourage business where the preponderance of freight was so large in one direction that the supply of empty cars exceeded the demand for return loads at full rates. *Boileau v. P. & L. E. R. Co.*, 24 ICC 129 (1912); *F. Schumacher Milling Co. v. C. R. I. & P. Ry. Co.*, 6 ICC 61 (1893); *James and Abbott v. Tenn., Va. and Ga. R. Co. et al.*, 3 ICC 225 (1889).

²⁵ Here defined by the Board "as the additional cost of carrying the traffic in question over and above the costs which would be incurred if it were not carried."

²⁶ The Board was consistent here, as it had previously stated: "We are of the opinion that economic considerations do not demand that at all times the rates for any class of traffic or type of service must cover the fully allocated cost of carrying that traffic or providing that service; rather that rates must at all times be reasonably related to costs. The test of reasonableness must include recognition of variations in the ability of traffic to carry a full share of costs at different stages in the development of that traffic, the effect of low rates in generating new traffic and the resultant effect of increased volume on reductions in unit costs" (*Air Freight Rate Investigation*, 9 CAB 340 [1948]).

operation, and there is an inherent cost advantage in the availability of the space which can be used at little added cost. It is the Board's opinion that to prohibit ratewise the use of such space would not only impair the sound economic development of air cargo but require higher rates in the predominant direction. Thus lower directional rates, by permitting a fuller utilization of space, would aid the shippers not only in the backhaul but in the predominant direction.

Accumulation, Assembly, and Distribution Rules

Almost since the beginning of air freight transportation, airline tariffs have contained rules providing for accumulation, assembly, or distribution services. The purpose of the assembly and accumulation rules has been to permit the consolidation of small shipments over a period of time for movement to a single consignee at one destination. The purpose of the distribution rules has been to permit a shipment consisting of parts ultimately destined to be delivered as part shipments to move as a unit to destination and there be broken for distribution of the several parts. In connection with these rules, the effect has been to permit the aggregation of a total weight subject to a lower rate than would apply to each component part if shipped individually.

The Civil Aeronautics Board investigated these practices of the airlines in 1949 because it was felt that they might affect the cargo rate minima which the airlines had established in 1948.²⁷ A Board order setting forth the assembly and distribution service rules was issued in September, 1950.²⁸

Pursuant to accumulation rules, all parts of a shipment received by a carrier within a given period (which varies with different airlines from twenty-four hours to one calendar week), from one consignor at one address for transportation on one air waybill to one consignee at one destination address, can move at the volume rate which applies to the total weight, just as if the individual parts had been tendered at one time, provided the aggregate weight of all the parts equals or exceeds a specified minimum weight. This minimum weight also varies from airline to airline, being as low as 1,000 pounds in some instances and as high as 16,000 pounds in others. There is usually no charge for accumulation service in addition to the line-haul service,

²⁷ CAB Order, Serial No. E-1639, June 2, 1948.

²⁸ *Investigation of Accumulation, Assembly and Distribution Rules*, CAB Dockets Nos. 1705 *et al.*, Consolidated, 3978, and 4259 (1950). See also CAB Order No. E-4954 issued December 20, 1950, dealing with the same docket numbers and subject.

and the usual practice is for the carriers to forward individual parts of the accumulated shipment as received, rather than to hold them until the entire shipment has been placed in their hands.

Assembly rules vary considerably, but in general they provide a service similar to that provided under accumulation rules. However, assembly and accumulation rules differ in three important respects: (a) the provision of accumulation service is dependent upon the aggregate weight, being equal to or greater than a minimum specified, while assembly service will be provided on any shipment, regardless of the aggregate weight; (b) there is no charge for the performance of accumulation service, but there is for assembly service; (c) accumulation rules do not specify or limit the persons who may request the service nor those for whom the service might be provided, whereas assembly rules usually provide for services thereunder to be performed on the instructions, and for the account of, the consignor or owner.

Rules and practices of the carriers are also different for distribution services. The rules usually provided that, upon prior instructions from the consignee or owner, the carrier will break a shipment at destination and distribute the individual parts for the account of the consignee or owner. This rule is not always observed, however, since carriers perform distribution service at the request of the consignor for multiple consignees and this might involve delivery of parts of a shipment at more than one destination.

Charges vary for both assembly and distribution services, with the predominant charge being 25 cents per part, minimum \$1.00 per shipment. Some carriers charge only for each addressee in addition to the first. If delivery service is provided, each part is assessed a delivery charge based upon the weight of the individual part in accordance with applicable pick-up and delivery tariff provisions; these charges are in addition to that for the distribution service. Some carriers require prepayment of charges on distributed shipments, whereas others permit charges to be either prepaid or collect.

Proponents of the accumulation, assembly, and distribution rules argue that such services make air freight more attractive to shippers and consignees, and enable certificated direct air carriers to compete rate-wise with forwarders and irregular air carriers. Opponents of the rules urge that their use reduces cargo rates below the minimum level of reasonableness, and afford an unfair competitive tool which would enable direct carriers to acquire business which otherwise would go via forwarders.

The Board has held that the performance of accumulation, assembly, and distribution services by the direct air carriers is not unreasonable nor unjustly discriminatory, unduly preferential, nor unduly prejudicial and that, therefore, they should be permitted to continue. It is true that the revenue per ton-mile obtained by the carrier is less on shipments receiving any of the three services than would have been realized if the component parts had moved as separate shipments, but that difference is justifiable insofar as such shipments retain some of the characteristics of large volume shipments for which the Board has previously found reduced rates to be lawful.

The Board's rules for assembly (or accumulation) do not provide that such shipments must be transported as a whole. In other words, there is nothing to prevent an airline from transporting some of the parts of a shipment before all of them have been received by the carrier or from transporting a shipment in different aircraft. By so doing, the carrier is prevented, of course, from moving all the parts of a shipment as one unit, one of the factors justifying varying rates with variations in the size of shipment.²⁹ This, however, is logical for air transportation, where the major difference between large and small shipments is in ground costs. Also, any minor differences in transportation costs between small and large shipments may well be offset by the advantage to the carrier of being able to ship the parts of an assembled or accumulated shipment at the time most convenient from an operational standpoint, without waiting for the receipt of the last part of any particular shipment. However, if carriers were permitted to ship parts of an assembled or accumulated shipment as received and to deliver them at destination as the parts arrived, there would arise an unjust discrimination against shippers of single shipments. For this reason, the Board has ruled that all parts of an assembled or accumulated shipment must be delivered at destination at one time as a single unit, except in those cases where a part or parts have been misplaced. Under such provisions, carriers are afforded maximum flexibility of operations without causing undue discrimination against shippers of single parcels.

²⁹ In the case of surface transportation, the practice of moving part of a shipment under assembly or accumulation rules prior to receipt of the entire shipment has been found unjustly discriminatory. See *Southern Pacific Company's Ownership of Atlantic Steamship Lines*, 43 ICC 168 (1917). See also *Aggregating Express Shipments*, 192 ICC 301 (1933); *The Providence Coal Company v. The Providence and Worcester Railroad Co.*, 1 ICC (1887); and *Forwarder Rates Conditioned upon Aggregates of Tonnage*, 264 ICC 225 (1945).

Consolidated Freight Tariffs

As soon as they began handling air freight, the airlines realized that they should, if possible, avoid the development of an unwieldy and complicated rate structure. Therefore, as a step toward simplification and ease of working with tariffs, they decided to issue consolidated rules, regulations, and tariffs.³⁰ All the certificated airlines agreed to take part in such a move, although the agreements, being subject to the approval or disapproval of the Civil Aeronautics Board, were on a temporary basis until the Board could look into the entire matter of tariff publication. This investigation took approximately four years, after which time the Board issued a qualified approval of the airline action.³¹

The objective of the consolidated air freight tariff agreement is to provide reasonable through service, establish reasonable and just rates by the participating air carriers, and eliminate unnecessary variance in classification, rules, regulations, practices, and services in connection with the transportation of air freight. These are very practical objectives. From the point of view of the carrier, relatively simple and uniform rules add to the attractiveness of the service offered and tend toward elimination of confusion for the user. They also help speed the movement of interline shipments and aid in developing a smooth-working transportation system.

The Board approved the efforts of the airlines to achieve uniformity of rules and regulations, particularly since the carriers emphasized their intention not to follow a program of uniformity at all costs, but rather to provide for a considerable amount of flexibility which would eliminate stagnation, sometimes the price of uniformity. The Board also approved the publication of consolidated air freight tariffs and the designation of an agent to file and publish such tariffs. It was recognized that such publication offers many advantages: the shipper is provided with one tariff instead of 20 or 30, making it much easier to check rates and other tariff provisions affecting him; a shipper has complete information concerning the services of participating carriers; and the airlines save expenses of tariff publication and distribution. Against these obvious advantages is the disadvantage that consolidated tariffs tend to eliminate competition in the

³⁰ CAB Order No. E-179 (December 12, 1946); CAB Order No. E-755 (August 15, 1947).

³¹ *Air Freight Tariff Agreement Case*, CAB Docket No. 2719 *et al.* (1951).

field of rates. The Board held that this would not be in the public interest, since it would make it more difficult to pass on to the public, in the form of lower rates, any lower costs which development of air freight transportation might bring. However, after balancing this tendency against the demonstrated advantages of a consolidated tariff, the Board concluded that by and large the public interest would not be injured by generally approving such a tariff for air freight.

The Board denied the airlines the right to permit competing carriers to meet one another's tariff changes, at the time they became effective, by having advance notice of the changes. This would bring about uniformity of rates as well as rules and regulations. Here the Board deviated from provisions of the Reed-Bulwinkle Act, where the Interstate Commerce Commission held that rates charged for transportation, if clearly not beyond the bounds of reason, were of "inferior importance to obtaining rates that, among other things, are as steady as the nature of things is practicable."

Whatever might be the state of rail freight transportation and factors determining rail rate-making procedures, the Board said:

We are not presently prepared to accept the proposition that the level of air freight rates is of little importance compared to the maintenance of uniformity in such rates. Compulsory filing of advance notices of proposed tariff revisions would tend to eliminate individual incentives in this area as it would deprive a carrier of the opportunity of obtaining a competitive advantage from such initiative. . . . Elimination of the opportunity would mean the removal of almost the last vestige of competition in the air freight field, since the other parts of the agreement already discussed provide for uniform rules, regulations, service, and practices.

With these limitations, intended to maintain rate competition among the carriers, the airlines received Board approval for their consolidated tariffs.

*Passenger Fares*³²

The airlines have so far enjoyed more latitude in setting passenger fares than in making freight rates, but nevertheless the Board has had to take strong action from time to time. During World War II the profit position of the airlines was greatly improved by peak loads and high aircraft utilization, so that the Board considered a rate reduction appropriate. Therefore, in February, 1943, it instituted its first proceeding to investigate the lawfulness of passenger fares and issued an

³² See Lucile Sheppard Keyes, "Passenger Fare Policies of the Civil Aeronautics Board," *Journal of Air Law and Commerce*, Winter, 1951.

order requiring eleven of the sixteen carriers then operating to show cause why air passenger fares should not be reduced 10 per cent.³³ This investigation was never pushed to its conclusion, being dropped after five airlines had complied by reducing rates from 6 to 10 per cent. Again, in January, 1945, in connection with the setting of the 45 cents per ton-mile mail rate for the "Big Four" carriers, a general reduction in passenger fares took place, resulting in passenger fares and mail rates being the same on a ton-mile basis for American Airlines, United Air Lines, Trans World Airlines, and Eastern Air

TABLE 32
PASSENGER FARE YIELDS, 1949-53

DOMESTIC TRUNK-LINE CARRIER YIELDS PER PASSENGER-MILE BY TYPE OF FARE (CENTS)			
Fiscal years ended June 30	Coach	Family Plan	Standard*
1949	4.17	4.39	5.91
1950	4.29	4.55	5.90
1951	4.26	4.47	5.88
1952	4.31	4.46	5.75
1953	4.14	4.38	6.06

AVERAGE YIELD PER PASSENGER-MILE BY CARRIER GROUPING (CENTS)					
	Domestic Trunk	Local Service	International	Territorial	
				Alaskan	Other
1949	5.82	5.41	7.89	.....	7.53
1950	5.64	5.47	7.43	.....	7.03
1951	5.54	5.49	7.18	.....	7.09
1952	5.58	5.71	7.06	12.44	7.04
1953	5.50	5.61	6.95	15.93	6.92

Note: International carriers began separating coach data in the Form 41 Reports in March 1953. Data to June 30, 1953, indicate a yield of 5.63 cents per revenue passenger-mile in international coach service.

* Includes a small amount of excursion-fare and other special-fare travel.

Source: Civil Aeronautics Board, *Annual Report, 1953*.

Lines.³⁴ When larger airlines reduced their fares to 4.5 cents per mile, the smaller carriers were forced to follow; and these rates remained in effect until 1947. Passenger fare yields from 1949 through 1953 are shown in Table 32.

The failure of anticipated traffic volume to materialize at the low rates, coupled with the increasing general price level, caused two increases of 10 per cent each in fares for most of the carriers during

³³ CAB Docket No. 850 (1943).

³⁴ Each passenger, including free baggage, was figured on the basis of 200 pounds, and so ten passengers equalled one ton, which at 4.5 cents per mile per passenger figured out to 45 cents per ton-mile.

1947. These were requested by the airlines concerned. The passenger fare level then was about 5.5 cents per passenger-mile. Financial difficulties continued to harass certificated airline operators, however, so that, in 1948, fares were increased to approximately a 6.5-cent level. What began as a rate increase, not ordered by the Board but at least given its "blessing," turned out to be a rate-cutting fight among the larger carriers. Various "promotional" tariffs were filed with the Board as experimental and temporary.

The experimental fares and tariffs filed by various airlines during the latter part of 1948 and early part of 1949 fell into two general groups:

1. *Coach-Type Fares.* These fares were typically at a level of approximately 4 cents a passenger-mile for specific "coach" flights, operating generally during off-peak periods and offering a less luxurious standards of service than was usually provided by the airlines.

The Board found that, under certain conditions, coach tariffs generated a substantial quantity of new air travel which could profitably be carried by the certificated carriers. The special conditions which seemed to require consideration in evaluating air coach operations were first listed as: (a) that the operation be conducted over routes having a heavy flow of traffic; (b) that high density equipment (equipment having more than the average number of seats) be used in most cases; (c) that the service be scheduled so as to minimize the diversion of traffic from regular flights; and (d) that all nonessential services to the passenger, such as meals, extra stewardesses, full reservations procedures, etc., be eliminated.

After coach operations by the trunk airlines had been in operation for about a year, the Board changed its requirements as follows: (a) permitted the abandonment of the off-peak scheduling requirement, at least for transcontinental operations; (b) relaxed the requirement of using less speedy, nonluxury equipment; (c) permitted the making of tentative coach reservations by telephone; and (d) granted regular first-class baggage allowances to coach passengers.

On October 5, 1953, the Board issued a "Coach Policy Statement" which indefinitely extended existing services of this type at fares no higher than those then in effect, approximately 4.5 cents per passenger mile. The Board's decision was based on the facts that such operations had been profitable, had contributed significantly to growth in total air traffic, and had apparently caused little net diversion from

other services. The Board stated that fares for new coach services would not be subject to specific cents-per-mile ceilings, but to the general requirement that a proposed fare shall not disrupt the coach-fare structure in the area concerned and shall conform to the statutory standards applicable to fares. The only specific requirement applying to a fare for a new coach service is that it must not exceed seventy-five per cent of the corresponding first-class fare. The Board indicated its belief that a 25 per cent differential is the minimum that will reflect adequately the cost difference between the services, maintain an adequate fare distinction, and provide the incentive to generate additional traffic which is necessary for an economically sound service. The Board also retained restrictions for distinguishing coach from first-class services as follows:³⁵ (a) limitation of hours of departure for off-peak (night) coaches; (b) a minimum seating density, reasonably related to the safe carrying capacity of the aircraft, for coach service not restricted as to hours of departure;³⁶ (c) no free food service except for coffee or similar beverages on all coach service flights.

2. *Family Fare Plan.* By the middle of 1950, all but one of the domestic air carriers had established a so-called family fare plan under which members of a family might travel at a reduction (usually 50 per cent of the regular first-class fare) if traveling with the head of the family on certain off-peak days of the week, such as Monday, Tuesday, or Wednesday. This plan has been successful in building up traffic for the carriers during the periods of the week when traffic is usually light. The success of the plan in generating new traffic, as opposed to simply diverting traffic from a peak to an off-peak period of the week, is still not entirely clear; but the indications from the material which has been submitted to the Board, from time to time, by the carriers are that a considerable proportion of family fare traffic is newly generated.

In all the years of regulatory control under the Civil Aeronautics Board, the airlines have never had a general passenger fare investigation. Early in 1952, however, when the domestic trunk lines filed tariff revisions proposing to increase each one-way domestic passenger ticket by \$1.00 and to eliminate the 5 per cent discount for round-trips, the Board instituted³⁷ an investigation of these changes and of

³⁵ CAB, *Coach Policy for the Certificated Domestic Carriers*, statement of October 5, 1953.

³⁶ Minimum seating densities for coach aircraft used in coach services were set as follows: DC-4 64; DC-6 72; DC-6B 76; Constellation 049 to 749 79; Constellation 1049 88.

³⁷ CAB Order No. E-6305, April 9, 1952.

the general level and structure of fares. It also suspended changes which proposed to eliminate the round-trip discount. In response to the petitions of the carriers, however, the Board dismissed the formal investigation and determined to make an informal study of the problem.³⁸

In view of the fact that passenger revenues account for more than eighty-two per cent of all revenues received by the trunk airlines between 1939 and 1952,³⁹ it seems almost incredible that the principles upon which passenger rates have been sporadically raised and lowered, and the principles upon which the overall passenger fare level is justified, have never been investigated. The Board's devotion throughout the years to the problem of air mail and freight rates has, of course, been proper, but might be considered short-sighted in view of the relative importance of each of these classes of traffic to airline income.⁴⁰

The usual procedure for constructing fares is to first determine what average return per mile should be received over an airline's entire system. Transcontinental carriers usually set this at 6 cents. To obtain a net of 6 cents after adjustments, a basic rate of slightly more than that amount is estimated.⁴¹ This basic rate is then applied to the nonstop airport-to-airport mileage between adjacent points to obtain the basic fare between those points. The basic fare may then be adjusted either upward or downward in order to meet the competition of other airlines or surface carriers, to provide for increased or decreased costs over the particular segment, or for numerous other rea-

³⁸ *The General Passenger Fare Investigation*, CAB Docket No. 5509 (1953).

³⁹ SOURCES OF DOMESTIC TRUNK AIRLINE REVENUES, 1939-52

	(Add 000)	Per Cent of Total
Passenger revenues	\$3,555,779	82.3
Mail payments	437,489	10.1
Air Express and Freight	234,409	5.4
Other	94.242	2.2

See Dissenting Opinion of Member Adams in CAB Order No. E-7376, May 14, 1953, *The General Passenger Fare Investigation*, CAB Docket No. 5509.

⁴⁰ The CAB has conducted a number of investigations and heard complaints concerning various passenger fare matters despite its lack of an overall study. Typical of these are: *Eastern Air Lines Rerouting Rule Case*, 11 CAB 278 (1950); *Summer Excursion Fares Case*, 11 CAB 218 (1950); *The Free and Reduced-Rate Transportation Case*, CAB Docket No. 2737 *et al.* (1951); *Tour Basing Fares*, CAB Docket Nos. 4443 and 4480 (1951); *North Atlantic Tourist Commissions Case*, CAB Docket No. 5422 (1952); *Pan American Ferry Flight Case*, CAB Docket No. 5477 (1953).

⁴¹ For some years this basic rate was 6.175 cents for American Airlines and United Air Lines and 6.193 cents for Trans-World Airlines.

sons. After these final adjustments, the fare for the segment is established. To construct the fare between points not adjacent, the segment fares are added together to obtain a basic fare. This basic fare, after such adjustment as seems necessary, becomes the final fare. Although not the only fact considered, mileage is given primary consideration in the establishment of a fare, since the mileage involved bears a strong relationship to both the operating costs and the value of the service rendered.

Common Fares

The charging of common passenger fares between a single point of origin and various points of destination, in order to permit the competitive meeting of fares between pairs of points via circuitous routings, is an inevitable result of the present methods and concepts employed in constructing airline fares and the practice under which competing carriers charge equal fares between the same points even though they fly different routes.

A passenger fare between a pair of points is generally constructed by applying a constant rate per mile to the mileage by way of the shortest route of any carrier via all certificated intermediate points on its route. Other carriers serving the same pair of points ordinarily meet this fare, even though the mileage along their routes is greater. The fare so constructed becomes the maximum charged between any other pair of intermediate points on the competing segments, on the theory that fares between any pair of intermediate points should not be higher than those between more distant points. A circuitous carrier, therefore, could have intermediate points on its route for which it would be compelled to charge fares identical to the fare between the competitive points based upon the shorter route of another carrier.

Competition between carriers is, of course, highly desirable, and no effective competition would exist if carriers could not charge the same fares for travel between the same points. The practice of meeting fares between competitive points, however, reduces the average revenue yield of the longer route carriers, and in some cases this reduction is very substantial.

Where sufficiently circuitous routings are used, it might be supposed that passenger preference for direct service would minimize the harmful financial effects of the reduced average yields. The carriers, however, permit stopovers enroute without any change in the through fare, and in many instances this makes the circuitous routing more attractive than the direct routing. To the extent that stopover

privileges are used at common fare points, the transportation between them in certain instances becomes in effect free transportation.

Under the present fare structure, a common fare is charged by all air carriers for first-class passage between Chicago and West Coast points. This fare applies to all the major terminals such as San Diego, Los Angeles, San Francisco, Portland, and Seattle, as well as the smaller points between San Diego and Seattle.⁴² In addition to the common fare thus available, the carriers permit alternate routings to several of these West Coast cities and unlimited stopovers, all without any additional charge. Thus, for the same fare, a passenger from Chicago can fly directly to San Francisco (1,856 miles);⁴³ or he can go via Los Angeles, stopping over at that city (2,091 miles); or he can travel via San Diego and Los Angeles (2,300 miles), stopping over at each city. Similarly, a Chicago passenger to Los Angeles can fly directly to Los Angeles (1,751 miles), or via San Francisco (2,196 miles), or via Tucson, Phoenix, and San Diego (1,960 miles), all for the common first-class fare. Passengers from Chicago to intermediate points between Los Angeles and San Francisco, or between Portland and Seattle, may travel for the common fare and use either of the appropriate gateways. Passengers from Chicago to points intermediate to San Francisco and Portland may also travel for the common fare, but the San Francisco gateway must be used to and from points south of Medford and Klamath Falls, Oregon, and the Portland gateway for points north of these cities. Either gateway is available for Medford and Klamath Falls. Portland and Seattle are also common-rated from Chicago, and a passenger to either of these cities may stop over at the other without paying additional fare. However, a passenger from Chicago to Portland by way of San Francisco must pay an additional fare equal to the local fare between Medford and Portland and, conversely, the Chicago-San Francisco passenger via Portland must pay an additional fare equal to the local Medford-San Francisco fare.⁴⁴

⁴² The rules and practices applicable to Chicago-West Coast passage apply also to fares and passengers between any point east of Chicago and the West Coast, where the fare is constructed by adding to the Chicago-West Coast fare the local fare from the eastern point to Chicago.

⁴³ Mileages are nonstop if such flights were available in June 1951. If no nonstop was available, the shortest mileage operated is listed.

⁴⁴ A passenger to Portland, buying a round-trip ticket, could go one way via San Francisco without any increase. This could be done by buying a round-trip ticket to Medford, going one way via San Francisco and returning via Portland. A passenger would thus travel via San Francisco, stop over at that point, proceed to Medford on his one-way ticket, and from Medford, he would travel to Portland on part of his return ticket, stopping over at that point, and returning to Chicago.

Passengers from Chicago to points between San Francisco and Medford are not allowed a stopover at Los Angeles, as is permitted San Francisco passengers. Passengers to points between Portland and Medford are not allowed an alternate routing via Seattle.

The existing common fare structure is the result of long development. Common fares to West Coast cities from Chicago and points east were inaugurated by the railroads in the latter part of the nineteenth century. They were established to meet the competition of water carriers which charged a common fare for trips from East Coast ports to West Coast ports. Competition between the various railroads also contributed to this result. In air transportation the common fare principle for Chicago–West Coast passage was first adopted in 1931. Paralleling railroad history, such fares were established at that time to meet railroad competition and competition between air carriers. The natural result of this long history of common fares is that the economy of West Coast cities, intermediate points as well as major terminals, has become geared to the concept that all will compete equally insofar as the more important passenger rates from the East are concerned. Thus, for example, when these communities compete for tourist business and national conventions, differences in mileage with their otherwise concomitant differences in fares play no part in inducing the business of the prospective customers. As a result, communities which might otherwise be at a disadvantage because they are a greater distance from the East, have engaged in extensive building and business operations, including terminal facilities. It is obvious that these enterprises and investments would suffer if passengers from the East to such more distant points were charged a greater fare.

It is significant that this equality of competition in respect to such fares has proved desirable to all the West Coast cities, including those which are closer to the East. Thus, West Coast communities and civic bodies are all unanimously opposed to a departure from the common-fare structure. Even Los Angeles, which would obtain a definite advantage by virtue of being closer to Chicago than the other West Coast points, objects to any such change. With but one exception, the air carriers have also been strongly opposed to any change in the existing fare structure and practices.⁴⁵

The Civil Aeronautics Act requires that the Board, in appraising the justness and reasonableness of fares, consider whether the prin-

⁴⁵ American Airlines, while contending that the common-fare structure was not unlawful, indicated a willingness to experiment with a limited change in the existing fare structure.

ciples involved in making the fares will tend to produce sound economic conditions and yield sufficient revenue to support an adequate air transportation system. On this basis, a fare-making principle by which varying amounts of transportation are furnished for the same money under similar conditions inevitably results in a fare structure which will invite economically unsound conditions, since such fares are not related to distance, and therefore not to cost. One possible justification may be that this compels competition from other carriers requiring the same fare for a longer distance. Another may be a clear demonstration that, in the particular circumstances, such a generally unsound fare structure will nevertheless improve the revenues and strengthen the economic position of the carriers. Competition is not a necessary element in finding undue preference and prejudice as between passengers; the Interstate Commerce Commission in passing on questions of preference and prejudice in the passenger field has found preference and prejudice without any reference to inter-passenger competition.⁴⁶ Indeed, to hold otherwise would be to say that passengers have no right to fair treatment as compared to that given other passengers unless the service performed is substantially identical. This would lead to the incongruous result that property shippers could be protected against inequitable treatment in comparison to the treatment accorded other shippers using similar but not identical services, but passengers could not be so protected. Passengers as well as shippers are entitled to protection against preferential and prejudicial treatment, and, as indicated above, a showing of competitive relationship is not necessary for preference and prejudice to passengers. Similarly, in the case of passengers it is rarely possible to establish actual damage, nor should this be required to support a finding of preference and prejudice as between passengers.

The Board has several times studied the subject of common fares. In 1949⁴⁷ certain joint passenger fare tariffs filed by United Air Lines, providing a common fare between various West Coast points and all the islands of the Hawaiian group, were found to be unjust and unreasonable and unduly preferential and prejudicial both as

⁴⁶ *Virginia Highland Citizens Assoc. v. Washington Virginia Ry. Co.*, 30 ICC 593 (1914); *Gorsch v. N.Y., N.H. and Hartford R.R. Co.*, 50 ICC 487 (1918). See also *Railroad Commission of Wisconsin v. Ann Arbor Ry. Co.*, 177 ICC 588 (1931). This is also true in the state courts and under the English statutes. *Gulf C. & S. F. Ry. Co. v. Moore*, 805 W. 426 (Civ. App. Texas 1904) *Innes et al. v. London, Brighton, and South Coast Ry. Co.*, 2 Nov. & Mac. Ry. Cases 155 (1875). *Baxendale et al. v. Great Northern Ry. Co.*, 1 Nov. & Mac. Ry. Cases 202 (1858).

⁴⁷ *Hawaiian Common Fares Case*, 10 CAB 921 (1949); *Pacific-Northwest Alaska Tariff Investigation*, CAB Docket No. 5060 *et al.* (1954).

between persons and as between localities. This finding was reaffirmed in 1950.⁴⁸ Again, in 1952,⁴⁹ the Board investigated the situation, described above, between eastern and West Coast points (Fig. 28). The Board characterized this situation as "unique" and stated:

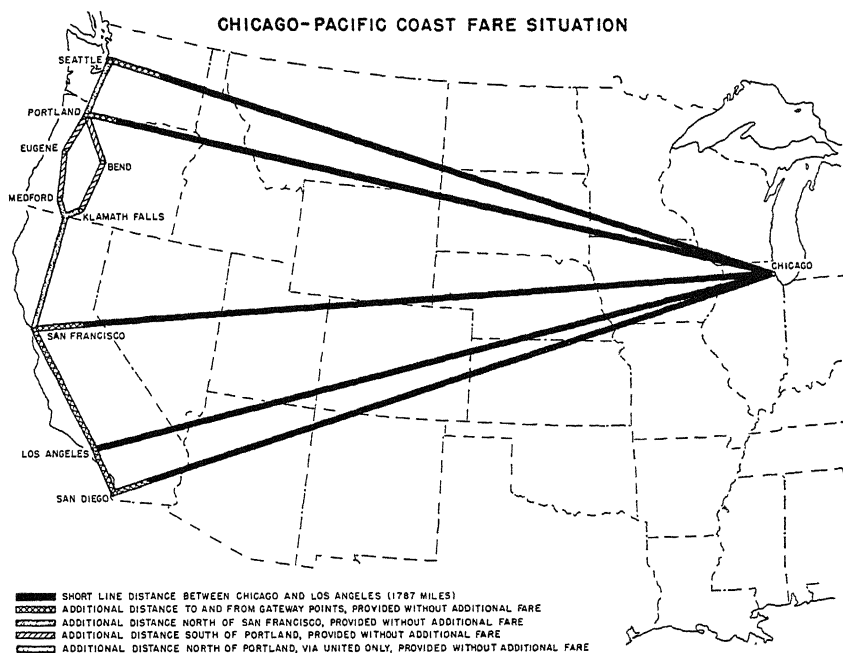


FIG. 28. The amount of "free travel" being provided between Chicago and the West Coast. By charging 6 cents per mile for each mile not now being compensated for, it is estimated that carriers between the points shown would realize nearly half a million dollars more revenue per year.

Unlike the *Hawaiian Common Fares Case*, where the Board was asked to approve a proposed common fare, this case deals with a fare structure and practices which have been in effect for many years and to which the business of the communities involved have been adjusted. We are loath to disturb this situation absent a more compelling reason than mere difference in mileage to the various points involved. This is not to say that either the communities or the air carriers acquire a prescriptive right to such a structure or practices, or that the Board as an agency of the Government considers itself estopped from changing such structures and practices. Nor does our present ruling foreclose us from investigating this matter again in the future and ordering such changes as we may deem warranted at that time. Quite obviously, the instant proceeding, involving as it does a unique situation, does not furnish a yardstick by which other common fare structures may be measured to determine whether they are unduly prejudicial or unduly preferential. Each case must be decided upon its own facts. Without departing from the principles

⁴⁸ CAB Order No. E-3965, March, 1950.

⁴⁹ *West Coast Common Fares Case*, CAB Docket No. 4586 (1952).

laid down in the *Hawaiian Common Fares Case*, we hold only that on the record before us in this case, the existing common fare structure and practices involved here are not unduly preferential or unduly prejudicial.

General Rate Policy

The airline rate policy, or, as it is sometimes called, its "price policy," is an increasingly important problem facing the industry. This is to be expected since the industry is moving out of the novelty or luxury class, and, therefore, pricing and price or rate competition become of more importance. As air transportation comes more and more into direct price competition with surface carriers, which have traditionally charged rates and fares materially below the air carriers, and as air passengers are drawn from an increasingly price-conscious market, sound rate policies become mandatory for the future development of the industry. No gift of prophecy is necessary to forecast that on the future rate policies of this industry will depend to a major extent the future volume of traffic, both passenger and freight.

As has been discussed previously in this chapter, we have already seen some important changes in airline rate making and an awakening of price-consciousness on the part of the industry, the traveling and shipping public, and the Board. After the close of World War II and until late in 1948, airline pricing was basically simple, particularly as long as these carriers were primarily passenger conscious. One took the air route distance between two points and multiplied by a standard fare level of a certain number of cents per passenger-mile. There were, of course, a considerable number of exceptions within such a general structure, reflecting competitive routings, through routes, regional differences in the fare level, and the like. There were also surcharges for luxury equipment and even a scattering of special promotional fares. But although the fare level moved down and then up, several times in the postwar period it moved within the same simple framework and without much thought of pricing as a promotional or regulatory instrument.

Beginning in the fall of 1948 and extending through 1949 and 1950, the industry became increasingly aware of air transportation pricing. This fare-consciousness was reflected in the coach fares and other types of promotional rates already discussed in this chapter. These coach and other pricing experiments were approved by the Board with considerable caution. Even so, the Board was accused by some members of the industry of adopting policies which would "re-

sult in bringing the entire airline price structure of the industry crashing down about our ears." On the other hand, others accused the Board with equal vigor of being too timid, of lacking enthusiasm for an experiment which it helped to start. The Board was, however, feeling its way. The danger that the limited promotional fares and services could quickly give way to violent fare cutting was not to be ignored.⁵⁰

This attitude of the Board was wise, since the industry was not then, or is it now, ready for rate reductions on an across-the-board basis. Despite increased traffic, it still needs a general fare level between 5½ and 6 cents a passenger-mile. The airlines are not ready financially for a general 4-cent-per-mile domestic passenger rate. To make broad and deep fare cuts would inevitably, at least during the last few years, invite either financial disaster or else enormously increased subsidization. In the immediate future, therefore, a continuation of promotional pricing on a restricted and highly selective basis seems to be the course of wisdom. This does not mean, however, that both the industry and the Board should not start preparing answers to some of the price policy or rate problems which are bound to arise sooner than some perhaps think.

The Board's policy, in effect since 1949-50, of selective promotional pricing appears to have been successful, both as to passengers and freight, in assisting the airlines out of a bad financial period and at the same time bringing to the traveling and shipping public the advantages and opportunities of air transportation at reduced fares and rates. Nevertheless there are obvious limitations to this policy in terms of the long-range development of air transportation.

The general criteria and objectives of a sound long-range rate and fare policy have been summed up as follows:

1. The further encouragement and development of air transportation.
2. Reasonable simplicity of the fare and rate structure.
3. A close relationship between the level and structure of rates of fares and cost to the carriers of performing various types of services so that the various classes and types of traffic each bears as nearly as possible its fair share of costs.
4. A fare and rate structure and level which, at least in sum, will be fully compensatory to an increasingly wide area of the industry so that the carriers can operate without being a burden on the general taxpayer through subsidy support.⁵¹

⁵⁰ See Joseph J. O'Connell, Jr., "The Price Tag for Air Travel," an address before the American Association of Airport Executives, April 19, 1950.

⁵¹ *Ibid.*

These are the criteria which probably will determine the Board's general rate policy in the immediate future. Some of them are conflicting, at least in part, but so are the objectives set forth in the Civil Aeronautics Act of 1938, as, for example, the requirement that the Board foster sound economic conditions in air transportation at the same time that it is developing a system adapted to the present and *future* needs of the commerce, postal service, and the national defense. Obviously, there must be a balancing and weighing of objectives. This means that, domestically, more and more airline traffic should pay its own way and that subsidy should be increasingly restricted to special, experimental operations and to providing smaller communities with assistance during their initial period as airline stations. It should not be used as a tool to build up air traffic in general. There is simply not enough subsidy to do that effectively.

The fact that the industry is now in a period when it seems desirable to hold down the general fare and rate line, while at the same time experimenting with selective promotional pricing, gives the Board and the airlines a unique opportunity to start thinking and studying the long-range future of rate policy. If it is correct that rate policy will continue to grow in importance in the affairs of air transportation and that air fares and freight rates should meet, at least in broad outline, the objectives which are stated above, the change in emphasis may well result in a basically new regulatory approach by the Board and a basically new approach to the problems of air transportation by the industry.

Pricing problems are becoming more important as the area in which air transportation is self-sufficient expands. This, in and of itself, requires a reorientation of thinking on the part of the Board. Until very lately the chief concern has been with problems involving the route pattern, "need" carriers, and subsidy. There must, of course, continue to be shifts and improvements in the route pattern; and, to the extent that these can be intelligently and promptly made, the area of self-sufficiency for air transportation should be increased. There is also every indication that mail-pay and subsidy questions will continue to claim a great deal of the Board's attention for some time to come. But, as the area of self-sufficiency expands, the Board will be less concerned with subsidy questions and more and more concerned with developing a sound commercial fare and rate policy. In short, although the basic objective of the Civil Aeronautics Act of 1938—that is, the rapid development of air transportation to its proper and economic place in the transportation system of the United States—

will continue, the regulatory tools by which this promotional policy is carried out may be changed.

It is to be hoped, for example, that the Board can be less concerned with minute scrutiny of the efficiency and internal workings of airline management and instead devote more attention to the somewhat broader economic questions of rate making or "transportation pricing," not only within the airline industry itself, but as between air transportation and surface transportation. There should be nothing alarming, either for the Board or for the industry, about any such shift in emphasis; this is particularly true if the period of experimental promotional pricing is utilized to make a basic study of longer-range pricing problems. If the Board and industry do an intelligent and skillful job in the years immediately ahead, they should be able to avoid many of the pitfalls into which surface transportation has fallen, particularly some of the least justified complications which have crept into surface transportation rate and fare structures. Intelligent rate or pricing policies for passengers and freight can prove of much greater significance and assistance to the future development of air transportation than can any amount of government subsidy.⁵²

⁵² An example of the Board's current thinking on the passenger fare situation is their action in *Order Authorizing Discussions* adopted June 9, 1954. This order was issued as a result of a request by the Air Transport Association to grant the certificated domestic airline industry permission to enter into discussions with respect to ways and means of increasing revenues except compensation for the transportation of mail, which was being separately considered. This request was accompanied by a number of exhibits as to the current traffic and earnings position of the industry and clearly contemplated the possibility of discussions on increases in basic fare levels, which discussions, in the absence of permission by the Board, might be illegal under the antitrust laws and contravene the provisions of the Board order authorizing consolidated local and joint passenger tariffs (Order Serial E-5753, October 3, 1951). The Board stated that it believed such permission should be granted only upon a convincing showing (1) of an immediate need for basic changes in fare or rate structures or levels; (2) that such changes can practically be accomplished only through the requested discussions.

The Board held that "in our opinion the industry has failed to make a convincing showing that rate or fare changes are needed at this time . . . and that in a situation where industry earnings appear to be declining primarily because the growth of industry capacity has temporarily exceeded the growth in its traffic it would appear to be premature to rush into a consideration of basic fare changes as a remedy for the dislocation . . . also that in an industry as subject to short term fluctuations as the airline industry that changes in basic fare and rate levels should not be too closely tied in to short run fluctuations in earnings."

Chapter

10 * INTERNATIONAL AIR TRANSPORTATION POLICY OF THE UNITED STATES¹

IN THE years before World War II the United States really had no international air transportation policy other than to encourage the development of American-flag operations through mail payments, and virtually all of our international air operations were conducted by Pan American Airways (now Pan American World Airways) or by its associate company, Pan American-Grace Airways (known as Panagra). Although our laws made no provision for the concentration of international aviation in a single company, the administrative policy of the Post Office Department and even the actions of Congress encouraged that result.

¹ See Oliver J. Lissitzyn, *International Air Transport and National Policy* (New York: Council on Foreign Relations, 1942); Burnet Hershey, *The Air Future* (New York: Duell, Sloan & Pearce, 1943); J. Parker Van Zandt, *The Geography of World Air Transport* (Washington, D.C.: Brookings Institution, 1944); J. Parker Van Zandt, *Civil Aviation and Peace* (Washington, D.C.: Brookings Institution, 1944); Osborne Mance, *International Air Transport* (London: Oxford University Press, 1944); Matthew Josephson, *Empire of the Air* (New York: Harcourt, Brace & Co., 1944); Alberta Worthington, *International Airways* (New York: H. W. Wilson Co., 1945); Lucien Zacharoff, *Vital Problems of Air Commerce* (New York: Duell, Sloan & Pearce, 1946); Lucien Zacharoff, *The World's Wings* (New York: Duell, Sloan & Pearce, 1946); John C. Cooper, *The Right to Fly* (New York: Henry Holt & Co., 1947); Burr W. Leyson, *Wings around the World* (New York: E. P. Dutton & Co., 1948); Oliver La Farge, *The Eagle and the Egg* (Boston: Houghton Mifflin Co., 1949); *International Air Transport Policy* (House Doc. No. 142, 79th Cong., 1st sess.) (Washington, D.C.: U.S. Government Printing Office, 1945); *International Commercial Aviation* (Sen. Doc. No. 173, 79th Cong. 2d sess.) (Washington, D.C.: U.S. Government Printing Office, 1946); *International Civil Aviation, 1945-1948 and 1948-1949* reports of the representative of the United States to the International Civil Aviation Organization (Washington, D.C.: U.S. Government Printing Office, 1948, 1949); Department of State, *Aspects of United States Participation in International Civil Aviation* (Washington, D.C., 1949); IATA: *The First Three Decades* (Montreal: International Air Transport Association, 1949); John C. Cooper, *Summary and Background Material on International Ownership and Operation of World Air Transport Services* (Princeton: Princeton University, 1949); Henry L. Smith, *Airways Abroad* (Madison: University of Wisconsin Press, 1950).

Pan American's monopoly was largely the result of the corporate policy of Pan American itself. Once having achieved a dominant position and having secured the requisite operating rights, Pan American always seemed in the position of being the carrier best qualified to receive the air mail contracts, which were the foundation of prewar commercial aviation. The award of air mail contracts to Pan American rather than to other American companies gave Pan American the indispensable economic basis for survival and expansion. Other companies were not so fortunate. For example, it is reported that the Postmaster General refused to advertise for air mail contract bids until Pan American and the New York, Rio and Buenos Aires Airline (NYRBA) merged, a decision which enabled Pan American in September, 1930, to acquire a strong potential competitor.²

Soon after its establishment, the Civil Aeronautics Board moved to encourage competition in the international field. In this respect, the Board has consistently held that the development of a sound air transportation system properly adapted to the national needs, as outlined in the Civil Aeronautics Act, demands that more than one international air carrier be certificated under the American flag. The Board has stated:

We recognize that competition from foreign air carrier services will develop on important routes. Such foreign competition, however, is not an adequate reason for abandoning the present statutory policy of this Government. The greatest gain from competition whether actual or potential is the stimulus to devise and experiment with new operating techniques and new equipment, to develop new means of acquiring and promoting business, including the rendering of better service to the customer and to the country, and to afford the Government comparative yardsticks by which the performance of United States operators can be measured. No matter how many foreign competitors may be in the field their research and development will not be fully available to our industry. The technical advancement of aircraft that may be stimulated by competition, together with progressive and competitive engineering and research associated therewith, will contribute to the peace-time advancement and maintenance of the aircraft manufacturing industry.³

But the Board's decisions supporting such a state of affairs were not made really effective until after the close of World War II. For example, the refusal of Congress to vote an air mail appropriation for American Export Airlines, after the Civil Aeronautics Board had resolved the issue of steamship ownership by granting a certificate of

² See Lissitzyn, *op. cit.*

³ *American Export Air, Trans-Atlantic Service*, 2 CAB 16 (1940); *Northeast Airlines, Inc., et al., North Atlantic Route Case*, 6 CAB 319 (1945).

convenience and necessity for a trans-Atlantic operation, has been interpreted as indicating that a majority in the Senate was favorable to a single-company policy at that time. With respect to the issue of steamship ownership, Pan American successfully challenged the order of the Board,⁴ and thereafter, in conformity with the court's ruling, the Board entered an order requiring American Export Lines to divest itself of its ownership of American Export Airlines.

Without any change in the public policy provided for in the Civil Aeronautics Act of 1938, the Board in the international route cases heard since the close of World War II has found that the public interest requires the operation of more than one United States international air carrier. It has sought to develop the strongest possible system in international air service, providing competition only where it has been considered to be justified by the actual and potential traffic. For example, in the so-called North Atlantic Route Case,⁵ the Board certificated American Export Airlines and Transcontinental and Western Air (now Trans World Airlines), in addition to Pan American, to provide service to London and to Paris and beyond to other points in Europe, the Near East, and Asia. Before the war, both Pan American and Panagra had extensive routes in Latin America. The Latin American Decision,⁶ granted new routes in the Caribbean, Central America, and South America to several other United States-flag carriers. Braniff Airways was certificated to operate to Mexico, Cuba, the Canal Zone, and South America; Chicago and Southern Airlines to Caracas, Venezuela, San Juan, and other points in the Caribbean; Western Airlines, to Mexico City; Eastern Air Lines, to Mexico City and San Juan; National Airlines, to Havana; Colonial Airlines, to Bermuda; and American Airlines' temporary extension to Mexico City was made permanent. A number of additional services were also granted both Pan American and Panagra.

Pan American was also operating across the Pacific before the war. In the Hawaiian Case,⁷ United Air Lines was authorized to operate between Honolulu and San Francisco. In the Pacific Case,⁸ Northwest Airlines was certificated to operate to Alaska and the Orient from the terminal points of New York and Chicago via the intermediate points of Twin Cities and Edmonton, Canada, and from the terminal points

⁴ *Pan American Airways Co. v. Civil Aeronautics Board*, 121 Fed. (2d) 810.

⁵ 6 CAB 319 (1945).

⁶ 6 CAB 857 (1946).

⁷ 7 CAB 83 (1946).

⁸ 7 CAB 209 (1946).

of Seattle. In the same proceeding, Pan American was authorized to extend its Central Pacific route from Midway to Tokyo, Shanghai, and Hongkong and from Manila to Saigon, Singapore, and Batavia; this route was further extended from Hongkong to Indo-China and India to connect with Pan American's North Atlantic route. Pan American thus became the only carrier to operate around the world. Pan American's South Pacific route was extended from New Caledonia to Australia. In addition to the new round-the-world route of Pan American, the Board extended Transcontinental & Western Air's North Atlantic route from India to Shanghai to connect with newly authorized Pacific routes, thus establishing in effect a second United States-flag round-the-world service. New services between the United States and Africa resulted from an authorization issued to Pan American in the South Atlantic Case,⁹ to operate between New York and the co-terminal points of Johannesburg and Capetown via the Azores, Dakar, Monrovia, and Leopoldsville. In addition, Pan American's present route to Brazil was extended beyond Natal to Ascension Island and Johannesburg and Capetown.

The development of Pan American Airways was inevitably influenced by the necessity of coming to terms with the several governments through whose territories operating rights were sought. In general, the influence of the foreign governments was directed toward obtaining as much service as possible; and, fortunately, political considerations were not of great importance.

In the prewar years, American international aviation by and large was able to develop without regard to the policies pursued by other air-minded nations. Throughout Latin America the problem was largely one of meeting subsidized European operations. Inasmuch as the two American airlines were willing to serve on a commercial basis and the service was welcomed throughout Latin America, Pan American Airways and Pan American-Grace Airways were able to obtain, sometimes with the assistance of our diplomatic representatives, the necessary franchises to permit the development of economically sound and comprehensive air operations.¹⁰

Similarly, Pan American Airways was able to extend its operations across the Pacific, using islands under United States sovereignty as stepping stones all the way to the Asiatic mainland. However, China

⁹ 7 CAB 285 (1946).

¹⁰ A willingness to assist in the promotion and development of national companies in Central and South America doubtless facilitated the development of its international network by Pan American Airways. See Josephson, *op. cit.*, chap. v.

was at that time unwilling to permit any foreign-flag operations to enter the country, a prohibition directed against Japan. Hence, the trans-Pacific line terminated at Portuguese Macao and at Hongkong, where the British granted landing rights after Pan American had secured landing rights at the nearby Portuguese Island. In 1941, Pan American extended its operations southward from Manila to Singapore, which required the company to negotiate operating agreements with other countries. Franchises were procured for a line running from Honolulu through Canton Island and Noumea (New Caledonia) to Auckland, New Zealand.

The establishment of trans-Atlantic operations, however, necessitated the active participation of the United States government. Although Pan American Airways and Imperial Airways, the British Company, were successful in their negotiations with Portugal for landing rights at Lisbon and Horta, negotiations through diplomatic channels were necessary in concluding the agreements with the governments of the United Kingdom (for England, Bermuda, and Newfoundland), Canada, and Eire. These formal governmental negotiations provided for the issuance of reciprocal operating rights by the governments concerned to the American and British companies. In like manner, reciprocal operating rights were issued for the service to France.

In prewar Europe the historical development was not very different. Air policy was made largely by the airlines themselves, working through pools and other cartel arrangements. While the several European states sought to foster their respective airlines for reasons of political policy, the airlines were successful in using the political power of the different countries to bolster and support the program of cartel co-operation which the various operators had worked out. Commercial aviation, therefore, developed according to a co-operative, rather than a competitive, pattern. Most European airlines, whether operated by government corporations or private companies, were supported by liberal subsidies of one kind or another.¹¹ The airlines of the several countries pooled their operations, with some agreements providing for a pooling of revenues. Expenses were not pooled, but operations were so allocated that each company became responsible for operating specific parts of the joint service at its own expense. For example, the flight from Stockholm via Copenhagen to Amsterdam might be conducted as a pool operation with three air-

¹¹ For a discussion of these various subsidies see Lissitzyn, *op. cit.*, chap. viii.

lines participating; but, if the route could support only three flights daily, the three participants would alternate in flying the route so that each would bear its share of the cost.

Objectives for United States Air Policy

During World War II the potential of international air transportation for the United States became fully apparent because of the remarkable combined performances of the armed forces and the airlines, the latter operating under contracts with the government. With the close of hostilities, it was realized that the objectives of the United States international air policy should be examined from two points of view: what policy would promote the best interests of the national economy, and what policy would encourage the maximum development of air transport.

Air transportation had become an indispensable instrument for the promotion of international trade and foreign investment. The availability of air mail to effect a quick interchange of intelligence—documents, legal papers, technical reports, and the like—supplied a service which could not be performed by the cable, radio, and telephone services. The availability of air transport made it possible for firms having foreign connections to maintain frequent personal contacts with foreign representatives or branch offices, to arrange for personal meetings with customers, and to call together executives from distant points for quick conferences.

Beyond its contribution to the advance of American business and industry abroad, the fullest development of air transportation was important to the people generally and to the security of the nation. The military importance of air transport in peace, as well as in war, gave an urgency to all policies which would encourage the intensive development of an extensive air transport industry. It was felt, moreover, that such an industry would serve to maintain manufacturing capacity, to train air personnel and ground forces, and to provide a flexible means of quick transport which might be of crucial importance in a military emergency.

It was decided that the first objective of United States international air policy must, therefore, be the maximum development of this mode of transport. This meant that the immediate concern of national policy should be the creation of the political and economic frameworks that would permit air transportation to achieve its full potential development.

At the same time, it was evident that it would not be good policy

for the United States to seem to dominate air transportation either in the Western Hemisphere or on a world basis. In fact, it was well understood that such a policy would create international antagonisms harmful to the whole industry. Within the limits dictated by essential national interests, it was decided, therefore, that our policy would be not to exclude any foreign-flag airline from seeking an opportunity to take part in the industry. The United States took a leading position in fostering the development of international air law along channels to facilitate the maximum growth and utilization of commercial aviation. Everyone understood that, in the interests of national defense, restrictions might have to be imposed upon the use of our air space and certain landing areas; but it was made clear that neither the United States nor any other nation should seek to use its sovereignty of the air or its control over airports to handicap foreign-flag operations in the interest of giving improper advantage to its own airlines. Even though political means may have to be used at times to prevent discrimination against a nation's airlines by other countries, a sound economic framework is indispensable to a sound air transport industry. The international policy under which commercial aviation operates should assure that no company will be discriminated against by reason of its nationality or size. The policy should assure that an airline's chances of survival and success will depend upon efficiency and economy, not upon political manipulations or privileged position.

In summary, the nation's policy¹² was to seek to assure (a) that United States aviation would continue to be progressive in the development and adoption of the newest types of equipment and the best operating procedures, (b) that adequate incentives would compel efficiency in operation, (c) that the full economic potentialities of air transport would be realized by a constant widening of the market through reductions in costs and rates, (d) that healthy financial conditions would assure the inflow of adequate capital, and (e) that United States airlines would carry a volume of world traffic commensurate with the importance of the United States as a market for air transport services.

Air transportation is a national asset, an implement to promote international trade and investment. However, it must be recognized that an extensive international trade is necessary to support an intensive air transport industry. The best guarantee that United States interna-

¹² See *International Air Transport Policy* (House Doc. No. 142, 79th Cong., 1st sess.) (Washington, D.C.: U.S. Government Printing Office, 1945).

tional aviation will find a large sphere for service will be the encouragement and expansion of American trade and investment in all parts of the world in order to develop business travel and shipping; otherwise air transport can have only an insecure economic base in the foreign travel of American tourists.

No problem can be solved on its own level alone. The national policy with respect to air transportation cannot be framed simply with reference to the commercial interests of air transportation. The relationship of air transportation to other modes of transport, to the development of the national economy, to the preservation of healthy competitive conditions at home and abroad, and above all to the military security of the nation indicates that commercial aviation must always be the servant, not the master. Therefore, a discussion of national policy must proceed with an awareness of the limitations and requirements of all the public interests which impinge upon this form of transportation.

International Legal Framework

The legal constitution under which international aviation has operated is a product of developments over a period of years. Like most social institutions, the system of legal principles governing air transportation has lagged behind the technical and commercial growth of the industry. The tremendous technical advances that occurred under the stimulus of war necessity made the institutional lag in the growth of legal principles a serious obstacle to the resumption of worldwide aviation after the war.

International aviation has been carried on under the principles established by a series of international conventions. The most important of these was the International Convention for Air Navigation (C.I.N.A.), concluded at Paris in 1919. This convention was ratified by twenty-six countries and served as the constitution for international aviation outside of the Western Hemisphere. This convention was not ratified by the United States, because it was associated with the League of Nations, to which this country did not belong. The C.I.N.A. Convention asserted the principle of national sovereignty of the air; and, as finally interpreted and amended, it required that explicit authority be secured from each country before commercial air services might be operated over that country. C.I.N.A. was never able to deal with international aviation on a worldwide basis since its membership consisted chiefly of European countries.

The Pan American Convention on Commercial Aviation, signed at

Havana, Cuba, on February 20, 1928, also recognized that each country had complete and exclusive sovereignty of the air over its own territory and territorial waters. This convention was signed by twenty-one countries, including the United States. By its terms, the convention extended "freedom of innocent passage" to aircraft engaged in air transportation; but, in practice, the air carriers of one signatory power have been required to obtain special permission to establish scheduled operations over the territory of other parties. Thus, international aviation in the Western Hemisphere developed under legal principles substantially similar to those embodied in the C.I.N.A. Convention.

During World War II, the United States policy for a bilateral approach¹³ to the matter of securing landing rights for our airlines was formally announced in a joint statement by the Department of State and Civil Aeronautics Board.¹⁴ This provided that the Department of State was to conduct negotiations with foreign governments for any new or additional landing rights which might be determined desirable through collaboration between the Board and the State Department. It was expected that the rights acquired in this manner would be in general terms, not mentioning any specific carrier or carriers until the Board could determine the fitness and ability of applicants for certificates of convenience and necessity. This statement also provided that foreign air carriers applying to the Board under section 402 of the act for permits to operate into the United States should forward such applications through diplomatic channels for transmission to the Board. The Board, however, stated that, while landing rights were to be secured through intergovernmental negotiations as a general procedure, this practice was not to be considered arbitrary or inflexible and that, therefore, an air carrier might present any unusual or compelling reasons which it thought would justify it to conduct independent negotiations with a foreign nation.

This joint statement of policy for acquiring foreign landing rights on the bilateral basis was inaugurated by the United States for the following principal reasons: (a) the desire to avoid confusing and perhaps embarrassing situations resulting from several carriers competing with each other in negotiations with foreign governments or

¹³ The terms used in this discussion to denote method of international agreement may be briefly defined as follows: *unilateral*—between a company and a nation, but the company (air carrier in these instances) can not bind the country of which it is a citizen; *bilateral*—between two nations; *multilateral*—between more than two nations.

¹⁴ Memorandum issued by the Civil Aeronautics Board, December 2, 1943, addressed to "all holders of and applicants for certificates of convenience and necessity."

foreign carriers, (b) the desire to avoid a situation whereby a carrier which had successfully concluded such foreign negotiations was later denied a certificate by the Civil Aeronautics Board on the grounds that convenience and necessity did not justify the operation contemplated, and (c) the desire to avoid the possibility of any exclusive arrangement being negotiated by an individual carrier which would be designed to restrict the Civil Aeronautic Board's power to select operating carriers. In the interest of equity to all United States air carriers, the Board could not be influenced in the final selection of a carrier by consideration of special or private arrangements previously concluded by that carrier on its own initiative.

The discussion of a postwar legal framework for international aviation at first centered on proposals to achieve a greater measure of freedom for international aviation through a multilateral agreement signed by all interested nations. The necessity of negotiating bilateral agreements between countries or unilateral agreements between the air carrier of one country and the country over which it proposed to operate, both to fly over the country and to engage in air commerce to and from the country, operated in prewar years as a serious restriction upon the establishment of the most economical air routes. Countries denied such operating rights to foreign-flag airlines in order to promote their own airlines or for reasons of political hostility. In other instances, operating rights were granted subject to restrictive conditions which prevented or retarded the development of the best service. It was realized that in the future it might be anticipated that the continuance of the old practice of individual negotiation with respect to each air operation would constitute an even more serious obstacle to international aviation. More countries were interested in promoting their own international services, and they were more disposed to be insistent on securing reciprocal rights for their own air carriers or prescribing conditions designed to improve the competitive position of their own airlines. All these facts led to the conclusion that international aviation must have a more liberal legal framework if it was to develop on sound lines.

Realizing that a postwar international organization was needed not only to set up air navigation standards and practices for the whole world but also to deal with the economic problems of international air transport, the United States took the lead by inviting most of the nations of the world to attend an international conference on civil aviation to be held in Chicago in the latter part of 1944. Representatives of fifty-four nations attended. The only major nonenemy or nonen-

emy-occupied countries which did not participate were Argentina, which was not invited, and the Union of Soviet Socialist Republics, which did not attend. Argentina, in June, 1946, agreed to the convention resulting from the Chicago conference, but Russia never took any action.

So far as civil aviation was concerned, the movement for international collaboration developed into three separate projects at this international civil aviation conference.¹⁵ The first proposal, made by the representatives from New Zealand and Australia, was that international civil aviation should be truly international in character, carried on by a single international corporation in which every nation should participate. This is a noble conception, but manifestly impractical and impossible of becoming a reality until all nations are prepared to pool their interests.

The second proposal was advanced by the British. It began by suggesting the establishment of an international board which should do for the world substantially what the Civil Aeronautics Board has done for the United States. Carriers which wished to fly international routes should apply for a license, and it would be granted or refused on an economic showing of international convenience and necessity. It was also proposed that such a board might even do things which the Civil Aeronautics Board cannot do and has never done, such as regulate the number of flights each company might make, determine the percentage of traffic which each country's lines might carry in any region, and allocate certain routes to certain countries to the exclusion of others.

The third plan of co-operation was proposed by the Canadians, who saw that merely assigning power to any international body, as proposed by the British, answered no questions. In consequence, beginning with the idea of an international Civil Aeronautics Board, they endeavored to analyze the job it would have to do. In their analysis they split the work of international air commerce into five elements, which have come to be known as the "Five Freedoms":

1. The right of transit or freedom for peaceful commercial aircraft to fly through the air of another country. This involves the right to use the air spaces of any nation for nonstop flight. The importance of the right lies in the fact that its denial may prevent an air service from following the most economical route. Although it is technically

¹⁵ See *Blueprint for World Civil Aviation*, Department of State Publication No. 2348 (Washington, D.C., 1945).

possible for United States airlines to reach all continents without passing over the territory of other countries, the shortest routes between the United States and either Europe or Asia pass over the territory of other countries. For example, the shortest route to northern Europe passes over or close to Canada, Greenland, and Iceland. Any operation to the interior of Europe would involve not only passing over foreign territory in this hemisphere but also passing over one or more of the countries of western Europe. It is of substantial advantage to the United States and to other air-minded nations if their airplanes enjoy the general right of passage over all countries.

2. The right to land for technical reasons, refueling, repairs, or other services, but not to take on or discharge commerce. This is of great practical importance. While it would be possible with airplanes now available to operate nonstop between United States airports and the principal traffic centers of the world, it would be highly uneconomical to conduct all international aviation in that fashion. The most efficient service can probably be rendered if planes stop at intervals of 1,500 to 2,000 miles for refueling, since flights in excess of these distances necessitate replacing valuable pay-load capacity with additional fuel.

It would therefore, be in the interest of the United States to have the right of transit and the right to land established as a universal principle for international aviation. Any arrangement less than a universal and worldwide arrangement respecting the right to land would be of limited importance for the United States. For example, a reciprocal exchange of landing rights with Great Britain, including the Crown colonies but not the dominions, would give the British valuable rights and would give the United States almost nothing.

The advantages accruing from a worldwide interchange of landing rights would be greatly in excess of any loss to any individual country that might result from granting such general rights with respect to territory under its sovereignty. For the United States, landing rights are most important in Canada, Newfoundland, Siberia, India, and on some of the islands of the Atlantic and the South Pacific. In so far as the continental United States is concerned, such rights of transit and landing would be of principal advantage to Canada in establishing service to Bermuda and to British Caribbean possessions, and to Canada and Australia or New Zealand in operating service between North America and Australia. Landing rights in Hawaii and Alaska are essential for any airline seeking to operate either of the two main routes between Asia and North America.

3. The right of commercial entry or freedom to carry traffic from a plane's country of origin to any other country. This would mean freedom for all commercial airlines (and other nonmilitary planes) to traverse the air spaces of any country without the necessity of securing prior permission from the authorities of that country, to land at any public airport, and to engage in air commerce, all subject to compliance with the applicable air traffic rules. This would mean free competition between national and foreign airlines.

4. The right to pick up traffic in other countries destined for the plane's homeland. Under this freedom, an American aircraft returning from Paris to New York could accept passengers bound only for the United States at Paris and at any other airport, such as Shannon, it might touch on the homeward journey. But it could not, unless the fifth freedom were agreed upon, carry a passenger who only wanted to go from Paris to Shannon.

5. The right for a foreign aircraft to carry traffic between countries outside its own. Thus, an American aircraft homeward bound from Paris could take on and drop off passengers and cargo moving between Paris and Shannon or between any other two countries along its route. This "fifth freedom" is of particular importance to nations like the United States that operate long-range, trunk-line international air services. Long-haul carriers seek fifth-freedom rights in order to keep their aircraft full over long international routes. The regional carriers of the different countries over which a long route might fly have difficulty in competing with the type of equipment and service which the large airlines offer on such routes. Governments are, therefore, inclined to request concessions in negotiating for flying rights in order to protect their national interests in their own airlines.

If all five freedoms are added up, commercial aircraft would have about the same rights in the air that ships have long had on the sea.

The Chicago conference resulted in the adoption of the following:

1. General principles for international air navigation and provision for the establishment first of a "provisional" and then of a "permanent" international aviation organization. By June 26, 1945, enough countries had signed the so-called "interim agreement" to set up the Provisional International Civil Aviation Organization (PICAO), which established offices in Montreal, Canada. This was later, on April 4, 1947, converted into the permanent International Civil Aviation Organization (ICAO), with offices at the same place.

2. An international air services transit agreement, incorporating the right to fly over sovereign territory and the right to land for non-commercial purposes.

3. An international air transport agreement incorporating various commercial air rights which were to be considered as the start of an attempt to handle the economic problems of international air transport through reciprocal granting of privileges on a multilateral basis.

4. Technical agreements which would eventually result in international standardization of air navigation procedures.

It was the third of the above agreements which proved the stumbling block. It was signed by the United States and a number of other countries, thus providing, as far as they were concerned, for real freedom of the air; but Great Britain refused to sign. As a consequence, a number of nations withdrew; and the United States was finally forced to take a step backward and abandon the international aviation principles for which this country had stood at the Chicago conference and withdraw from the International Air Transport (Five Freedom) Agreement conceived at that meeting. Circumstances, therefore, forced the United States to adopt a policy of bilateralism. Between the years 1944 and 1954, bilateral air transport agreements have been entered into with 45 countries, based largely on what has come to be known as the "Bermuda Agreement" entered into between representatives of the United States and the United Kingdom at Bermuda in 1946.¹⁶

The Character of Intergovernmental Agreements

The intergovernmental agreements to which the United States is a party are the most important part of the legal framework within which our international aviation must develop. Every consideration must, therefore, be given to concluding such intergovernmental agreements as will be conducive to the creation of a sound and progressive international air service. The problems of international aviation are, however, more complex than those of domestic commercial flying, for they are tied in with the right of foreign nations to refuse landing rights or to grant such permission only under conditions which may prove objectionable to our airlines.

The government of the United States has made marked advances

¹⁶ *Air Service Agreement—United States and United Kingdom* (signed at Bermuda, February 11, 1946), Department of State Publication No. 2565, Treaties and Other International Acts, Series 1507.

in securing air rights through bilateral negotiation. There is little justification for the criticism, heard from some quarters, which alleges that we have bargained away our competitive position, since in every case negotiation with other countries has required a recognition of their rights as well as our own. So far we have secured the operating rights required by our international airlines by providing for the exchange of such rights with nearly all the important nations of the world. While the pattern of these rights is stronger than those secured by unilateral (airline and country) negotiation, such a pattern still has two fundamental defects—a lack of stability and a lack of uniformity. For these reasons many feel that it is imperative that the bilateral agreements be replaced by the right kind of multilateral agreement as soon as possible.

It is relatively easy to cancel a bilateral agreement, since it involves relations with only one other nation and air transport operations with other nations can continue. While it is perfectly true that all nations desire access to United States traffic, so that any one of them will hesitate before canceling an agreement with us, still the economic and political pressures in the world today may impel one or more nations to insist upon amendments to bilateral agreements imposing restrictions on our right to commercial operation or, in the alternative, upon a cancellation of the agreements. Under a multilateral agreement, nations might cancel a separate bilateral route arrangement but would still be required to make no agreements inconsistent with the principles embodied in the multilateral agreement; consequently, they would find it impossible to bargain one by one into restrictive arrangements all the nations with whom they have bilateral agreements. Thus, it would become much more difficult, if not entirely impossible, for any nation to gain tangible advantages from the cancellation of a route arrangement. Although a nation might withdraw from the multilateral agreement entirely, there would be heavy moral pressures against doing so; moreover, there is the practical fact that there would be little to be gained, since its relations with all the nations participating in the multilateral agreements would have to be consistent with the terms of that agreement. Thus there are many forces which work against denunciation of a multilateral agreement but which are weaker in or absent from the bilateral pattern.

The bilateral system has another serious defect in its lack of uniformity. Bilateral negotiations, which involve all the provisions of an air transport agreement, inevitably lead to bargaining over each pro-

vision which is conceived to be of special interest to one or the other of the bargaining nations. In spite of strenuous efforts, it has been impossible for the United States to avoid making minor changes in various standard provisions. When the challenges come, as they will when other nations have developed their airlines to the point where competition for traffic is keener, these "minor" variations may present operating problems of considerable magnitude. For example, there are variants in the statement of "capacity language" in the agreements with India, the Philippines, China, Argentina, Australia, and others. The Annex of the Australian agreement comes close to a rate differential. There are many differences in the language affecting rates and charges.

A soundly conceived multilateral agreement would provide much needed uniformity in the general rules under which international air transport operations are conducted and would serve as a bulwark against attacks upon the present relative freedom of operations. There are, however, certain essential elements which would have to be contained in a multilateral agreement before it would be desirable from the standpoint of the United States: (a) Provisions calling for separate bilateral exchanges of routes. There are in today's world powerful economic and security reasons which make an automatic multilateral exchange of routes completely undesirable. (b) Provisions which will clearly allow adequate freedom for the carriage of third, fourth, and fifth freedom traffic. (c) Machinery for the handling of disputes by a method of arbitration that will assure expertness, impartiality, and some degree of continuity, rather than by resort to the Council of the International Civil Aviation Organization or some similar body. This group would operate only if negotiation failed.

Owing to the rapid development of aviation after the close of World War II, the need for international air services, and the desirability of securing the necessary air rights for United States air carriers without delay, it was determined that, as a matter of policy, bilateral air transport agreements should be negotiated as executive agreements rather than as treaties. Bilateral air transport agreements were concluded between the United States and eleven foreign governments during the fiscal year 1946 and with sixteen others during the fiscal year 1947. It is hardly possible that such a large number of agreements could have been concluded within this period had it been necessary to comply with the cumbersome treaty procedure requiring approval by the Senate. Executive agreements are subject to amendment from time to time in the light of new developments, thus afford-

ing an efficient and flexible procedure for modifying the terms of agreements. The treaty procedure, on the other hand, is not adaptable to continuous and frequent revision. In this connection it is significant that six of the forty bilateral agreements which we have concluded have already required amendment.

In section 6 (c) of the Air Commerce Act of 1926 and sections 2 (a) and (d) and 301 of the Civil Aeronautics Act of 1938, Congress has clearly set forth the policy of this government to foster air commerce between the United States and foreign countries. It has indicated its understanding that, in order to foster such air commerce, it is necessary to enter into agreements with foreign countries; and in section 802 of the 1938 act, the Secretary of State is recognized as the appropriate authority to negotiate such agreements (in consultation with the Civil Aeronautics Board). In section 1102 of the act, the Board is directed to exercise and perform its powers and duties consistent with any obligation assumed by the United States in any treaty, convention, or agreement that may be in force between the United States and any foreign country or foreign countries. Thus by legislation the Congress has specifically provided for certain types of agreements with foreign countries in the field of civil aviation being made by the Executive rather than through the treaty process.

The Air Coordinating Committee, in its statement of national policy¹⁷ governing international aviation, made the following recommendations regarding routes and rights:

1. The exchange of air transport rights will continue to be by bilateral air transport agreement until such time as it is possible to achieve a multilateral agreement which contains principles generally in accord with those of existing United States bilateral agreements.
2. The United States will adhere to the policy of negotiating for international air rights on the basis of all five freedoms.
3. In the negotiation of its agreements for the exchange of international air rights, the United States will continue to adhere to the Bermuda principles as the most satisfactory basis for relating capacity to traffic.
4. In determining the rights to be included in bilateral air transport agreements, the United States will continue its objective of establishing, insofar as possible, an equitable exchange of economic benefits.
5. The United States will seek interpretation and application of its agreements in a manner which will accord with the over-all objectives of an effective international air transport system.

Technical Facilities and Standard Operating Procedures

After a means had been developed to make it legally possible for the aircraft of one nation to operate into the airspace of others, an-

¹⁷ Air Coordinating Committee, *Civil Air Policy* (Washington, D.C., 1954).

other group of requirements was necessary before aircraft could operate internationally. These were the technical requirements for physical equipment and rules governing operation of world airways. These needs can be grouped as follows: (a) Physical equipment had to be obtained and installed at specific points. (b) Rules of the road and operating procedures had to be agreed upon. (c) In many of the actions under the above two requirements, it was essential that there be agreement on standards. For example, even if radio stations were to be established on a long route, it was important that the radio signals be identical and capable of receipt on one set. (d) Qualifications of personnel had to be agreed upon.

With respect to the physical equipment that had to be obtained and installed, it will be readily understood that international operation required airports with adequate runways, radio transmitters, radio receivers, and airways with navigation aids. Stations had to be established for collecting weather data and transmitting it to aircraft and to other stations on the ground. The size of this undertaking is indicated by the fact that when the plans were completed, they listed some 40,000 facilities which had to be located or services to be rendered in some manner.

The second group of requirements, namely, the rules of the road and operating procedures, presented peculiar obstacles because no other nation had anything like the United States' experience in volume commercial flying and, therefore, other nations were utterly unaware of the scope of the needs for such things as air traffic control. Americans were familiar with volume-flying into airports because in such cities as Chicago in a recent year the airline landing and take-offs numbered 266,825. This was an average of 731 per day, and that airport can handle 120 take-offs and landings per hour. But European nations had no such experience. The largest number of take-offs and landings in a given year even as late as 1953, at the busiest foreign airport, London, was only 45,501. This was the annual equivalent of the operations at Albuquerque, New Mexico, and averaged only 125 per day. Furthermore, at the start of our international operations there were no airways as we know them outside of the North American continent.

The third class of requirements was the establishment of safety standards. On some of these matters, the precise standard adopted was not so important provided it was used by all. Thus, the altitude of eastbound flights over the Atlantic could be at one level or another without catastrophe, provided that all operators followed the same practice. On the other hand, there were many areas in which the

choice of the standard was of immense importance to a number of American interests, and in the choice of these standards special care was necessary. Thus, if the radio equipment prescribed as the standard equipment in aircraft or in navigation aids on the ground were of foreign design and manufacture, American equipment might become obsolete and our manufacturers would lose their place in the world markets for that equipment. Again, if aircraft designs of foreign origin become world standards, American aircraft manufacturers could lose a strategic position in the market.

The fourth area of needs related to standards for qualifications of airmen and airworthiness of aircraft. This was important because it affected several interested groups. In the United States the men who operate the airport control towers and direct the movement of American aircraft are licensed by the Civil Aeronautics Administration to give the necessary assurance of competency. Our government questioned whether, in international operations, it could be given assurance that the aircraft control tower operators in all the countries into which our aircraft would operate would be qualified for the duties they perform. Similarly, how could our government be assured that pilots licensed by foreign countries were competent to fly safely over American cities without endangering other American aircraft and American residents on the ground?

Our government maintained it was of great importance that the standards of competency be exacting enough to assure us that foreign licensed personnel could perform their functions adequately and safely. To this end, the United States urged the adoption of its personnel licensing requirements, and American standards were in the main adopted in their entirety. This was beneficial for thousands of Americans who held pilot and other airman licenses, for it meant they were qualified to fly abroad without being required to pass additional examinations.

If the airworthiness of a foreign aircraft were to be questioned by each country into which it flew, a serious delay and expense could be imposed on airlines and other operators. Recognizing this, the Chicago Convention provided for agreement on standards of airworthiness which, if complied with, would permit recognition of the airworthiness certificates of individual countries and prevent duplicate examinations. Since American operators fly into as many foreign jurisdictions as the operators of any other flag, the burdens on Americans for duplicate inspection would be severe and the benefits from agreement would be enormous. Thus far it has proved impossible to

develop a set of complete, comprehensive, and detailed international airworthiness specifications for the type-certification and operation of aircraft. The primary objective of international airworthiness standards has, therefore, been to define, for application by the competent national authorities, the minimum international standards by which countries should recognize certificates of airworthiness for the purpose of foreign aircraft flying into and over their territories, thereby achieving, among other things, protection of other aircraft, third persons, and property.

The task of setting up technical facilities and standard operating procedures, such as those just discussed, has belonged to the International Civil Aviation Organization. Divisional meetings, held in Montreal and elsewhere and attended by technicians from member states and international organizations, have developed recommendations for standards in each of the technical fields. The representatives of American aviation interests have been brought together through the offices of the Air Coordinating Committee to consider this problem, and a United States position has been prepared after consultation with all interested parties. A delegation representing the American point of view has attended the meetings of ICAO and sought by negotiation to reach an agreement. Although the United States has been outstandingly successful in having its views accepted, there are and will be times when contrary practices are adopted as ICAO standards. The United States may, however, refuse to accept those standards and refuse to put into effect, in this country, the requirements contained in the international standards. Such a procedure has the desirable quality of permitting each country to determine, first, whether a standard is necessary, and second, even if necessary internationally, whether it is in such conflict with domestic practice or imposes such hardships that the inconvenience it would impose far outweighs the advantages to be derived.

*Procedure of the Civil Aeronautics Board*¹⁸

Certain procedures of the Civil Aeronautics Board are geared to implement international negotiations by affording expeditious action to foreign air carriers seeking entry to the United States. They are justified since substantially the same courtesies are extended our own carriers by other nations. Other procedure, such as the requirement of Presidential approval of foreign or overseas grants of routes, are

¹⁸ This section is adapted from *Statement of Civil Aeronautics Board before the President's Air Policy Commission*, October 27, 1947.

necessary from the point of view of a comprehensive and uniform international policy.

The Civil Aeronautics Act of 1938 prohibits a foreign air carrier from engaging in air transportation to the United States unless it has a foreign air carrier permit issued by the Board.¹⁹ By definition, foreign air transportation means the "carriage by aircraft of persons or property as a common carrier for compensation or hire or the carriage of mail by aircraft" in commerce between a place in the United States and any place outside thereof. Under the Civil Aeronautics Act, therefore, no authorization is required from the Board for the conduct of any services other than common carrier services. Just as for domestic air transportation, the Civil Aeronautics Act makes no distinction between scheduled and nonscheduled services in foreign air transportation.

The Air Commerce Act of 1926 provides that, if a foreign nation grants similar privileges, the Administrator of Civil Aeronautics "may authorize aircraft registered under the law of the foreign nation and not a part of the armed forces thereof to be navigated in the United States."²⁰ Foreign air carriers operating under foreign air carrier permits issued by the Board have, therefore, not been required by the Administrator to obtain foreign aircraft permits as required by section 6 (c) of the Air Commerce Act. However, the Administrator has required such permits in all other cases involving navigation in the United States of aircraft registered under the law of a foreign nation and not a part of the armed forces thereof.

It will be seen, therefore, that a clear distinction exists between operations authorized by the Civil Aeronautics Act of 1938 and operations authorized by the Air Commerce Act of 1926. The former includes all common carrier operations (scheduled or nonscheduled), and the latter includes all operations other than common carrier operations. In the administration of both acts, however, occasions frequently arise in which the exact status of proposed operations by a foreign company are difficult to classify. The difficulty of classification is increased by the fact that (a) requests for permission to operate necessarily precede actual operations and make it difficult to determine the precise nature and characteristics of the operation, (b) foreign countries do not in their law distinguish between common carrier and noncommon carrier services, so that it is frequently difficult to make clear the nature of the information required, and (c) the

¹⁹ Civil Aeronautics Act, sec. 402.

²⁰ Air Commerce Act, sec. 6 (c).

barriers of distance and language frequently serve to delay and complicate the task of clearing the requests for operating permission.

By mutual arrangement between the Board and the Administrator, the latter refers for clearance by the Board's staff all requests which appear to involve common carriage or to raise substantial doubt as to their noncommon carrier status. The staff of the Board may request further information in some instances and may request the Administrator to impose appropriate conditions to assure that the noncommon carrier status of the applicant will be preserved. By this procedure it has been possible to obtain co-ordination between the agencies and uniform application and enforcement of the statutory provisions.

The procedure for the issuance of these so-called "6 (c) permits" serves two purposes: it permits pre-inaugural operation of a noncommon carrier nature pending the issuance of a foreign air carrier permit, and it provides for the entry of foreign nonscheduled and charter aircraft pursuant to the same type of provision extended by other countries to comparable United States operations.

The ratification of the Convention on International Civil Aviation (Chicago conference) by the United States, and its subsequently being put into effect on April 4, 1947, has changed in certain respects the application of section 6 (c) of the Air Commerce Act in regard to aircraft of other contracting states. Article 5 of the Convention, which deals with aircraft other than those engaged in scheduled international air services, requires a contracting state to permit such aircraft of other contracting states to make flights into, and to transit nonstop across, its territories and to make stops for nontraffic purposes, all without the necessity for obtaining prior permission. Article 5 further states that such aircraft may take on or discharge passengers, cargo, or mail subject to the right of any state where such embarkation or discharge takes place to impose such regulations, conditions, or limitations as it may consider desirable. It therefore appears that Article 5 repeals the "prior permission" requirement of section 6 (c) to the extent that such prior permission would be required of aircraft or other contracting states operating in transit across United States territory or making stops therein for nontraffic purposes. With respect to stops for traffic purposes, however, the Convention and section 6 (c) may be construed together as requiring prior permission for the discharge or taking on of passengers, cargo, or mail.

While it is believed that this is a proper construction of section 6 (c), such construction is not entirely beyond doubt. Section 6 (c) deals primarily with the navigation of aircraft and not with condi-

tions for the embarkation or discharge of passengers and cargo. Through administrative interpretation, however, as indicated above, section 6 (c) has been used to impose conditions relating to the commercial activity of foreign aircraft being navigated within the United States. It is believed, therefore, that section 6 (c) can still be made applicable to this type of activity. However, since the question is not entirely clear, it is believed that the amendment of section 6 (c) would be desirable to indicate specifically, in the case of other contracting states under the Chicago Convention, that it is designed to regulate the embarkation and discharge of passengers and cargo but not to preclude other navigation of foreign aircraft under the rights granted by the Convention.

A definition designed to specify the difference between scheduled and non-scheduled services has, however, been adopted by the Council of the International Civil Aviation Organization. Its importance comes from the fact that the Convention on International Civil Aviation, which each member nation of ICAO has ratified, allows any aircraft not engaged in international scheduled air service to fly into or across the territories of each ICAO member without receiving prior permission, and, under certain circumstances, to carry revenue traffic into and out of these territories. On the other hand, a scheduled international air service must have special permission or other authorization from the government of each country it flies into or across. This definition provides as follows:

A scheduled international air service is a series of flights that possesses all the following characteristics:

- a) it passes through the air space over the territory of more than one state;
- b) it is performed by aircraft for the transport of passengers, mail or cargo for remuneration, in such a manner that each flight is open to use by members of the public;
- c) it is operated, so as to serve traffic between the same two or more points, either
 - i) according to a published time-table, or
 - ii) with flights so regular or frequent that they constitute a recognizably systematic series.

One of the objectives of the bilateral agreements made between the United States and other nations is the stimulation of international air travel as a means of promoting friendly understanding and goodwill. The fundamental purpose of these agreements is, therefore, the reciprocal exchange of air rights; however, any delay by one contracting party in granting operating permits to the designated airlines of

the other party in reality limits the effectiveness of such agreements to a unilateral grant of rights for the length of time that such permits are withheld. Such failure on the part of the United States or any other country to perform promptly the obligations necessary for implementing an agreement obviously creates neither friendly understanding nor goodwill and is bound to affect adversely its carriers in their relations with the other country concerned.

Our standard-form bilateral agreement provides that each of the air services described therein shall be placed in operation as soon as the contracting party to whom the air rights are granted has designated an airline for the operation of such route. It also provides that the contracting party granting the rights shall be bound to give the appropriate operating permission, provided that the designated airline may be required to qualify before aeronautical authorities of the latter party, under the laws and regulations normally applied by these authorities, before being permitted to engage in the operations contemplated by the agreement. This provision in the Bermuda agreement and in several other United States bilaterals includes the language "without undue delay." In either case the intent is the same, and an obligation is imposed upon each contracting party to grant the necessary operating permission as expeditiously as possible.

So far as the United States is concerned, section 1102 of the Civil Aeronautics Act requires the Board to perform its duties "consistently with any obligation assumed by the United States in any treaty, convention, or agreement that may be in force between the United States and any foreign country or countries . . ." However, the act also requires in section 402 that a foreign air carrier secure a permit through the formal process of notice and hearing—a process which is necessarily time consuming.

Prompt issuance of operating permissions by foreign governments has been of particular importance to the United States, whose airlines are usually prepared to inaugurate services immediately upon the conclusion of a bilateral agreement and frequently before the other country's airlines are prepared to operate. Other governments, having airlines capable of immediately inaugurating services, have complained of the undue delay and hardship to their airlines caused by the extensive documentation and hearings required by the Civil Aeronautics Act in reviewing applications for foreign air carrier permits. Ill feeling engendered by such difficulties has at times adversely affected the handling of applications filed by our carriers with foreign countries, particularly since few other countries impose requirements

as strict as those of the United States. A specific example of this was the action of the Swedish government with respect to the application of American Overseas Airlines for a route to Stockholm. The American legation in Stockholm was informed that the application of American Overseas had been approved but that such approval would not be announced officially until the United States issued a permit to SILA, the Swedish airline. It was emphasized that it had not originally been the intention of the Swedish government to make announcement of its approval contingent upon the granting of a permit to SILA, but that Swedish officials were "quite frankly irritated" over the delay encountered by SILA in obtaining a permit from the United States.

These complaints have arisen in spite of the fact that the applications have been handled by the Board with unusual speed and in most instances without the time which is necessarily consumed when there are interveners in the proceeding. The problem is simply that even an expedited processing of an application for a foreign air carrier permit compares unfavorably with the speed with which many foreign governments are able to act in granting operating permissions to our air carriers after the conclusion of bilateral agreements.

It has been suggested that section 402 of the act, providing for issuance of permits to foreign air carriers, be amended to require a finding of "public convenience and necessity." It is, however, difficult to see how such an amendment would accomplish any beneficial purpose in promoting the sound development of either national or international air transportation; nor does it appear that such an amendment would require the Board to take into consideration any matter that is not already used in determining whether the air transportation proposed by a foreign air carrier, in seeking to obtain a permit, is or is not in the "public interest."

Under the act as it now stands, the Board is authorized to issue a foreign air carrier permit after notice and hearing if the Board finds that the applicant is fit, willing, and able to conduct the air transportation properly and to conform to the provisions of the act and the rules, regulations, and requirements of the Board thereunder. In addition, the Board must make a finding that the air transportation proposed is in the "public interest."²¹ The Board has indicated, in cases

²¹ The Board stated in an early case involving an application for a foreign air carrier permit that the term "public interest" as used in the act was not a mere general reference to public welfare but had a direct relation to definite statutory objectives. The Board

involving foreign air carrier permits, that it considers the following as evidence of public interest: effectuating of international aviation agreements entered into by the United States,²² improvement of transportation facilities,²³ promotion of the "good neighbor" policy,²⁴ alternate routing during the winter months,²⁵ and expediting of service and reductions of costs.²⁶ From these cases it appears that the Board inclines toward a broad, flexible construction of the term "public interest," and that it will be construed in such a manner as to best promote the national and international policies of the United States. It should also be noted that, unlike applications for purely domestic service, section 1102 of the act requires that an additional and important factor be taken into consideration in passing upon applications for foreign air carrier permits. That section provides that the Board in exercising and performing its powers and duties under the

pointed out: "It is apparent from this section (sec. 2) that the interest to be considered is the national interest, and that the 'public' is not limited to the public within the corporate limits of the cities which the proposed application would link together. In determining whether the inauguration of the foreign air carrier service is in the public interest and will further the objectives of the act as set forth in the declaration of policy, we must consider not only the needs of the two sections to be served, but the national interest and the relationship that the proposed service bears to the development of a nationally adequate and economically sound air transportation system, as new services authorized should fit logically into the existing air transportation system" (*Trans-Canada Air Lines, Permit to Foreign Air Carrier*, 2 CAB 616 [1941]).

In another case the Board said: "We must, therefore, determine whether the public interest requires service between Montreal and New York in addition to that operated by the incorporated company pursuant to its certificate. This involves our consideration of some of the questions which we have stated in previous opinions to be essential to the disposition of applications involving the issue of public convenience and necessity in proceedings dealing with wholly domestic air transportation, namely, whether the proposed service (foreign air carrier service) will serve a useful public purpose responsive to a public need, and whether this need can and will be served adequately by existing transportation facilities" (*Canadian Colonial Airways, Ltd., Permit to Foreign Air Carrier*, 3 CAB 50 [1941]).

²² *Airways (Atlantic), Ltd., Permit to Foreign Air Carrier*, 2 CAB 181, 187 (1940); *Trans-Canada Air Lines, Foreign Air Carrier Permit (Whitehorse-Fairbanks)*, 6 CAB 529 (1945); *Swedish International Airlines, Foreign Air Carrier Permit (Stockholm-New York-Chicago)*, 6 CAB 631 (1946); *Trans-Canada Air Lines, Montreal-New York Service*, 11 CAB 209 (1950).

²³ *Caribbean Investigation*, 4 CAB 199 (1943); *Trans-Canada Air Lines, Permit to Foreign Air Carrier (New York-Toronto)*, 2 CAB 616, 622 (1941); *Trans-Canada Air Lines, Permit to Foreign Air Carrier (Whitehorse-Fairbanks)*, 6 CAB 529 (1945).

²⁴ *Aero-Transportes, S. A., Temporary Foreign Air Carrier Permit*, 6 CAB 159 (1944), 6 CAB 383 (1945); *Lineas Aereas Mexicanas, S. A., Temporary Foreign Air Carrier Permit*, 6 CAB 165 (1944), 6 CAB 299 (1945).

²⁵ *British Overseas Airways Corporation, Temporary Amendment of Permit*, 4 CAB 57 (1942).

²⁶ *British Overseas Airways Corporation, Amendment to Permit*, 2 CAB 823, 825 (1941).

act shall do so consistently with any obligation assumed by the United States in any treaty, convention, or agreement that may be in force between the United States and any foreign country.²⁷

If section 402 of the act were amended to include the term "public convenience and necessity," it would not change the requirements that foreign air carrier permits be approved by the President under section 801; nor would it accomplish any beneficial purpose or require the Board to consider an additional matter that is not now considered by it in making a determination that a proposed foreign air carrier permit is in the "public interest." In addition, the requirement of section 1102 would remain unchanged, so that the Board would still be required to act within the broad policy declared in the international air transport agreements.

Presidential Power Over International Routes

Under the Civil Aeronautics Act the President has the power to select the routes which can be operated in foreign and overseas air transportation by United States carriers or to choose the carriers for such routes.²⁸ It has been suggested that this power should be eliminated entirely or limited to a veto only; that is, the President would not have power affirmatively to choose routes or carriers.

Since the act became effective in 1938, there have been several instances in which the President, in the exercise of his power under section 801, has not followed the Board's recommendations.²⁹ Even so, the Board has indicated that the present powers of the President should not be changed,³⁰ because its consideration of new route cases is necessarily confined to the record made before it by the parties to

²⁷ In an opinion of the Attorney General dated June 18, 1946, in response to a request from the Secretary of State, it was stated that the statutory provisions of the act (secs. 801, 802, and 1102) made it clear that the Congress contemplated the consummation of agreements with foreign nations relating to international civil aviation and that the Attorney General concurred in the position taken by the Department of State that none of the then existing aviation executive agreements purports to waive the necessity of proceeding under section 402 of the act (*Opinions of the Attorney General*, Vol. XL, Op. No. 110 [1946]).

²⁸ Section 801 of the act provides in part that the "issuance, denial, transfer, amendment, . . . of . . . any certificate authorizing an air carrier to engage in overseas or foreign air transportation, or air transportation between places in the same Territory or possession, . . . shall be subject to the approval of the President."

²⁹ See *American Airlines, Mexico City Operation*, 3 CAB 415 (1942); *Latin American Service Case*, 6 CAB 857 (1946); *Colonial Airlines, Inc., et al., Atlantic Seaboard Operations*, 4 CAB 392 (1943); *North Atlantic Route Transfer Case*, 11 CAB 676 (1950); *Eastern-Colonial, Acquisition of Assets*, CAB Docket No. 5666 (1954).

³⁰ *Statement of the Civil Aeronautics Board before the President's Air Policy Commission*, October 27, 1947.

the proceeding and must be governed by the principles set forth in the act defining public convenience and necessity. After considering the record, the Board, as the administrative agency charged with the primary responsibility for developing a sound air transportation system, makes its recommendations in considerable detail to the President. However, the President has an additional responsibility in all matters pertaining to the proper conduct of our international relations, having under the Constitution responsibility and duty to conduct the foreign affairs of the United States. The President has access to many sources of information and to data not included in the record before the Board. Much of this data may consist of secret and confidential material which it would be improper to include in an open record. The President must also take into consideration many factors relating to the conduct of international affairs of which the Board is unaware. For this reason, many believe that the provisions of the present section 801 of the act should not be amended to remove this power from the President.

But this is not the only reason why the President's powers over international air transportation should be continued. Under the Constitution the Congress has power to regulate commerce with foreign nations, but the President has responsibility for the proper conduct of our international relations.³¹ In the handling of our international relations, the President speaks as the sole organ of our government entrusted with that function.³² It seems clear that, where the handling of international regulations overlaps the regulation of commerce with foreign nations, the possibility of serious and even disastrous conflict and division might result if the Congress did not entrust the balancing of conflicting considerations to the President.³³

The very nature of international cases makes it impossible for the Board's action to be final. Operating rights and privileges must be obtained from foreign countries, and these can be obtained only by bilateral or multilateral agreements and arrangements, with the President charged with the exclusive responsibility for negotiating such arrangements. A route and carrier selected by the President cannot

³¹ Constitution of the United States, Art. I, sec. 8, and Art. II, secs. 1 and 2.

³² *United States v. Belmont*, 301 U.S. 324 (1937); and *U.S. v. Curtiss-Wright Corp.*, 299 U.S. 304 (1936).

³³ In the absence of section 801, the act would strip the President of his "... very delicate, plenary, and exclusive power ... as the policy organ of the Federal Government in the field of international relations—a power which does not require as a basis for its existence an act of Congress" (*U.S. v. Curtiss-Wright Corp.*, 299 U.S. 304 [1936] p. 320).

be operated unless implemented by rights obtained from the foreign country under the President's supervision and direction. It makes good sense, therefore, to centralize the power to correlate and coordinate these actions of the government in the hands of the President.

It would be possible, of course, to amend section 801 so as to give only a veto power to the President, while at the same time circumscribing his present power to choose affirmatively the routes and carriers. In other words, the act could be made to spell out clearly that the President can either approve or disapprove but has no power to indicate which routes and carriers shall be selected. It would seem, however, that any attempt to circumscribe or decrease the President's powers in this manner would be either ineffectual or unwise. So long as he has power to disapprove the Board's action, the President can continue to disapprove successive solutions suggested by the Board until the Board finally comes forth with the solution which he is willing to approve. Rather than go through this ritualistic and time-consuming process, it is preferable to have the President indicate, at the first opportunity following his consideration of the Board's recommendations, the route and carrier which he will approve. On the other hand, if the act is amended so that the Board can override the President's veto, then obviously the conduct of international affairs may be prejudiced, and responsibility divided and weakened. Power to override the President's veto would be as unwise as complete repeal of section 801, for it is the controversial cases in which the President's views should and must prevail.

It would also be possible to change section 801 in other respects. It could be provided, for example, that the Board's opinions be published and made subject to judicial review before they go to the President for approval. It seems that such a process would be unnecessary and time-consuming in view of the fact that the President may reach a different result.³⁴

³⁴ The United States Circuit Court of Appeals for the Second Circuit held in *Pan American Airways Co. v. Civil Aeronautics Board*, 121 Fed. (2d) 810 (1941), that in proceedings under section 801 of the act the Board acts as the President's adviser and that the President and not the Board is the ultimate arbiter. In other words, said that court, "orders of the Board which by the provisions of section 801, require the President's approval, are considered to be in reality orders made by the President and not by the Board. . . . Such action is not subject to judicial review and in such circumstances a serious question arises as to whether it is within the power of the Board to reopen for further argument and consideration . . . a case in which all applications had been denied by the President."

In another case Colonial Airlines contended that section 402 (b) of the act as controlled by section 801 was a delegation to the President of the United States of the ex-

It would also be possible to amend section 801 so as to provide that the President's action shall be taken only upon the record compiled before the Board, that it shall be in accordance with the standards of convenience and necessity as set forth in the act, and that such action shall be subject to judicial review. This proposal, however, is subject to the same objections as the proposal to repeal section 801 entirely. It not only would prevent the President from taking advantage of information not in the record, but would also be ineffectual in view of his plenary power in the conduct of our international relations. For example, although the record might require the President to select carrier X for a particular route, the President in his conduct of international relations might find it necessary to reject both the route and the carrier in concluding a bilateral agreement with the foreign nation concerned. It is to be noted that international route decisions of the Civil Aeronautics Board are considered to be really orders of the President and as such not subject to judicial review.

Authority to Fix International Rates

Under the Civil Aeronautics Act the Board has jurisdiction to fix passenger and property rates between points within the United States, as well as to fix reasonable minimum and maximum rates in overseas air transportation, that is, in transportation between a place in the continental United States and a place in one of its territories or between a place in one territory and a place in another territory.³⁵ However, the Board lacks statutory powers to prescribe passenger and property rates for United States air carriers operating in foreign air transportation.

When the Civil Aeronautics Act was passed, there was considerable opposition to granting such power; but any argument against it has little validity today because of changed conditions. As a matter of fact, the opposition was sufficiently great and the doubt as to what should be the policy so manifest that section 404 (c) of the act empowered and directed the Board to investigate and report to Congress within one year the extent to which the federal government should regulate rates in foreign air transportation. Within the year, the

clusive plenary Congressional power over foreign commerce without any standards, limitations, or statutory controls whatever and consequently unconstitutional. This contention was raised directly before the United States District Court for the District of Columbia, and that court upheld the constitutionality of the challenged sections of the act (*Colonial Airlines, Inc. v. Russell B. Adams et al.*, 87 Fed. Supp. 242 [1949]). See also *C. & S. Air Lines, Inc. v. Waterman S. S. Corp.*, 33 U.S. 103 (1948).

³⁵ Civil Aeronautics Act, secs. 403 and 404.

Board made a report recommending that further extension of control over international rates not be made at that time, largely because of the limited extent of practical experience in the field.

In 1938 and 1939 long-range international air transportation was relatively unimportant. Further, the pattern of rate determination in the slowly developing field of international air transportation seemed destined to follow that of international shipping, where carrier conferences set the rates. Most governments concerned themselves little, if at all, with the rates charged by foreign air carriers operating into their territories or by their own air carriers operating abroad. Consequently, it seemed possible that it might unduly prejudice the interests of United States air carriers who might participate in rate conferences if they alone were subject to government control; and further it seemed possible that action by the United States in this field might lead to similar action by other governments.

Since 1939 the situation has changed completely. Every important nation of the world is participating extensively in international air transportation. The result has been a great increase in competition among air carriers throughout the world. Since nearly all air carriers are subsidized to a greater or lesser extent by their governments, it is natural that the increasing competition has led most nations to assert control over rates charged by air carriers operating into their territories.

This development has occurred even though the air carriers who are members of the International Air Transport Association (IATA) have created rate-fixing machinery. Under this machinery, rates for international air travel are considered at regular intervals at regional or joint rate conferences by the scheduled international airlines which are members of IATA. Rate agreements unanimously adopted by the conferences are binding on the individual airline members, subject, however, to approval by the respective governments. If the members of a conference do not reach unanimous agreement or if a rate resolution adopted by a conference is not approved by all the governments whose airlines are members of the conference, an "open rate" results; and the member carriers are free competitively to quote individual tariffs until another "closed conference rate" is agreed upon by all and approved. An open-rate situation exists continuously in certain areas, such as South America, where some carriers are not members of IATA and it is consequently impractical for the IATA members to bind themselves not to meet the rate competition of non-IATA carriers.

Since some areas of the world have been continuously in an open-rate situation and since one negative vote by a participating air carrier can create an open-rate situation in any area, the only recourse for a government wishing to protect its own air carriers from the dire consequences of a rate war in a subsidized industry is to assert its own power to approve or disapprove rates in international air transportation. This is, however, really more of a problem for foreigners than it is for Americans, as United States carriers have much more subsidy strength available.

This determination of foreign governments to retain control over international rates has been intensified by the position of the United States. The advanced state of our aircraft industry, the great experience and technical proficiency of United States-flag air carriers, and the economic strength of the government which stands behind them have combined to arouse the fears of foreign governments, especially since our government exercises no direct control over the international rates charged by its air carriers.

It is true that the Board does have an indirect control over such rates, when they are established through IATA Traffic Conferences;³⁶ but however useful such a control may be, it does not serve to calm the fears of other governments, who recognize the possibility that a United States air carrier can by a negative vote create an open-rate situation in which the Board's indirect control is no longer possible. Whether these fears concerning United States air carriers are justified is less important than the fact that they exist. The result has been that in negotiation of many of our bilateral air transport agreements, including those with most of the countries which are leaders in international air transportation, the United States has found itself handicapped because of the Civil Aeronautics Board's lack of power to determine fair and reasonable rates for our air carriers operating abroad. These countries have insisted, as a condition for according traffic rights to our airlines within their territories, that the possibility of destructive rate wars between international carriers be made impossible through the insertion in agreements of provisions relating to the fixing of rates. It has been the contention of these foreign countries that the United States carriers could operate more efficiently and cheaply due to the advanced state of our aviation industry than their

³⁶ This jurisdiction stems from section 412 of the Civil Aeronautics Act, which provides for approval of agreements between an air carrier and other air carriers and foreign air carriers. The IATA conference machinery was originally approved by the Board on February 19, 1946, subject to the reservation that each resolution of the conference establishing agreed rates must be submitted to the Board for approval.

carriers, and that unrestricted competition might drive the latter from the air. This fear, whether or not well founded, has been the driving force in their insistence on rate provisions.

The objective of these rate provisions in all cases is to assure that international air carriers will not charge unfair or uneconomic rates. To accomplish this objective, three alternative tools are provided for, as follows:

1. Rate fixing, where the aeronautical authority concerned has the power to set rates. If the other country involved does not agree that the rate set is a proper one, machinery is provided for consultation and ultimate reference to the International Civil Aviation Organization for an advisory report.

2. Unanimous agreement of all airlines concerned through the IATA Air Traffic Conference machinery, subject to the approval of the respective states involved.

3. Unilateral determination and exclusion by the foreign country in cases where no rate has been fixed by the aeronautical authority of the airlines and no rate agreement is in force, with provision for consultation between the states concerned and with reference to ICAO contemplated.

While the procedures contemplated by both (1) and (2), above, call for reference to ICAO in case of dispute about what the proper rate is, it is worthy of note that, if the rate has been fixed under (1), it will continue in effect until further action is taken by the party setting the rate, which action need not be taken until after the advisory report is handed down by ICAO. On the other hand, if the paragraph (3) procedure is followed, the airline involved may be prevented from operating into the foreign territory at the disputed rate until after the report from ICAO has been handed down.

Analysis of the foregoing alternative procedures indicates that direct governmental control is the most advantageous method of handling this rate problem. The rate is set in the first instance by the government whose airline is involved, and the burden rests upon the foreign governments to challenge the rate and to show that it is unfair and uneconomic. Under the conference method of procedure, as under the procedure of paragraph (3), there is an almost absolute veto power on the part of the foreign government, and the burden rests upon the national government of the airline concerned to challenge

the action thus taken. In effect, the choice is whether rates of United States international air carriers will be determined by the United States or whether they will be determined by foreign governments.

There are several important benefits that would accrue to our international air commerce from control by the Civil Aeronautics Board over international rates, in addition to the substantial advantage of having our rates given effect by foreign governments pending any intergovernmental consultation. If the Board has control over the rates of our carriers, any foreign fears of rate wars would be allayed; Board approval would be a virtual guarantee that the rates are reasonable and free from any taint of discriminatory, prejudicial, or below-cost characteristics. Disputes as to rates would be negotiated on a governmental level, not, as at present, with our carriers at a disadvantage in negotiating with aeronautical authorities of foreign governments. Indeed, the strongest argument for foreign interference with the rates of our carriers—the present absence of control by the Board—would be removed. Finally, it may be noted that the IATA machinery, on which we are now completely dependent, is susceptible to abuses. The requirement of unanimous action, a reasonable rule under present circumstances, imposes a necessity for compromise on a rate acceptable to all carriers, the low-cost and the high-cost; and in the absence of agreement on new rates, the tendency is to revert to the old rates in order to avoid open-rate situations.

Other countries do not hesitate to interfere with the rates of our carriers serving their cities and even to make the continuance of operations conditional on their observing acceptable rates. We are unable to exercise a similar control over foreign-flag carriers coming to this country, except by revocation of permits. The revocation of an operating right is too drastic a device to use in dealing with rate matters, as it invites retaliation against our carriers.

Thus far, emphasis has been placed on conditions in the international sphere which have led to the belief that it is necessary for the Board to exercise control over the rates charged by United States air carriers in foreign air transportation. Entirely aside from these considerations, however, is our domestic concern, which furnishes an equally strong reason. Lack of such jurisdiction may prejudice the economically sound development of this country's international air transport industry. Under the Civil Aeronautics Act the Board is required to fix rates of compensation for the carriage of mail and, in so doing, to take into account the broad policy objectives set forth in the

act,³⁷ including the need of each air carrier; and to the extent that these rates of mail pay exceed the actual cost of transporting the mail, they contain an element of subsidy. The Board has sought to keep the air mail pay bill of the government as low as possible, consistent with carrying out the public interest objectives of the act. In so far as domestic and territorial carriers are concerned, an element of control in this regard is provided by the Board's power to fix rates for the carriage of persons and property. The Board is empowered to influence the carriers' commercial revenues, in relation to costs, as it believes to be in the overall public interest. The direct cost of service to the public is balanced against the indirect public cost involved in subsidy payments.

However, under the Board's present lack of jurisdiction over international passenger and property rates, it is unable to influence the revenues of carriers engaged in foreign air transportation through review and determination of the rates which they charge. Such carriers may establish rates at levels which give them a less favorable profit-and-loss result than would be possible if rates were fixed at a different level. The Board has no power to prevent the establishment of such rates, and the United States government may well find that a unilateral action by one of its own air carriers in a field outside of governmental control has operated to increase substantially the amount of subsidy support required.

*International Aviation Organizations*³⁸

There are two international organizations dealing with aviation matters. The International Civil Aviation Organization (ICAO), which, as has been discussed, grew out of the Chicago Convention and became a permanent organization in 1947, and The International Air

³⁷ Civil Aeronautics Act, sec. 406(b). The Air Coordinating Committee in its report on "Civil Air Policy," *Supra*, made the following recommendations: (1) Full United States support, consistent with the Civil Aeronautics Act, should be given to the International Air Transport Association (IATA) as the primary instrument for establishing and maintaining a sound fare and rate structure for international air services. (2) The Civil Aeronautics Board should be empowered by Congress, through amendment of the Civil Aeronautics Act, (a) to control the fares, rates, rules, and practices of United States air carriers, applicable to transportation to and from the United States, to the same extent as the Board now has power to act with respect to domestic air transportation, and (b) to control the fares, rates and rules, and practices of foreign air carriers, applicable to transportation to and from the United States, more effectively than is now possible under the Civil Aeronautics Act.

³⁸ See Eugene Pepin, "I.C.A.O. and Other Agencies Dealing With Air Regulation," *Journal of Air Law and Commerce*, Spring, 1952.

Transport Association (IATA), the co-operative organization of the world's airlines.

Fifty-seven nations are now members of ICAO, whose airlines operate more than ninety per cent of all international civil air transportation. A number of nations are still absent from the membership list, one of these being Russia. China, formerly a member, withdrew in 1951. Subject to the conditions laid down in the Chicago Convention all nations are welcome to become members provided only that they agree to adhere to the principles of the Convention and to accept the corresponding responsibilities.

All member states of ICAO are sovereign and equal; the organization is governed by an assembly in which each state has one vote. The assembly meets annually; the first meeting took place in Montreal, Canada, in May, 1947. The assembly is the organization's legislative body. It elects a council of twenty-one members to serve as the executive body. The president of the council is elected for a term of three years.

The council, which remains in virtually continuous session, creates standards for international air navigation, an important feature of ICAO's work. It may act, if requested, as a tribunal for the settlement of certain international disputes. Under the terms of the Convention, it is responsible for the establishment of air navigation and air transport groups, each of which has responsibility for its own particular field of action. There are three other committees which play an important part in ICAO's functioning: the Legal Committee, the Committee on International Convention, and the Committee on Joint Support of Air Navigation Services.

The administrative functions of the organization are performed by the secretariat, the third principal organ of ICAO. It is headed by the Secretary-General. Secretariat members are selected for technical competence in their specialized fields. In order that the work of the secretariat may reflect a truly international approach, technical and senior administrative personnel are recruited on a broad international basis.

The ICAO has its most easily understood and, so far, its most effective area of accomplishment in the field of standardization of technical matters, such, for example, as the standards for airworthiness of aircraft, which are of obvious importance to passengers, operators, and manufacturers. Standards are developed first in international meetings of divisions of the Air Navigation Committee at which ex-

pert delegations come from the member states. The standards they agree upon are reviewed in relation to the standards in other technical fields by the standing Air Navigation Committee. After further opportunity for study by home governments, the standards come to the council for final approval. They come into effect under the Convention after compliance with further procedural requirements. It then becomes a requirement for member states to implement the standards through their respective national regulations, inspection services, and so on, or for them to announce to the world the specific extent to which they deviate from the agreed standards or practices.

Some examples of agreements that have been reached indicate the widely varied nature of the subjects dealt with—the qualifications and experience necessary for aircrew licenses, the amount of fuel that an aircraft must carry over and above that calculated to be necessary for a flight to allow for possible emergency and unforeseen contingency, standard symbols to be used on aeronautical maps and charts, and codes for the reporting of meteorological conditions.

ICAO also has certain powers of action in the field called “facilitation of international air travel and transport.” Here it deals with standards and recommended practices, expediting and simplifying customs, immigration, public health, passport, visa, and other border-crossing formalities. The procedure for developing standards and putting them into effect is similar to that in the technical field, and the legal effect of the standards when once adopted is the same.

The International Air Transport Association (IATA) has some 70 members working together to knit their individual routes into an international air transport system, along whose every mile there will be the same high standards of safety, economy, efficiency, and service to the public. In a world which speaks many languages and uses many varied systems of writing, law, currency, and measurement, IATA is the airlines’ answer to the imperative need for complete international understanding of all procedures, practices, and devices used in an industry in which all peoples are vitally concerned.

IATA is a voluntary association of airline companies, with headquarters in Montreal, Canada. Any company is eligible to join IATA as an active member if it operates a scheduled air service between two or more countries for the transport of passengers, mail, or cargo under the flag of a state eligible for membership in ICAO. Domestic operators of these states may join as associate members, participating to a limited extent in IATA activities and paying a lower subscription than active members.

Basic policies of the association are laid down by an annual general meeting, in which each active member company has a single vote. Direction of IATA's continuing affairs is vested in an Executive Committee, whose members are elected for terms of three years each. Its work is carried out under a Director General and other executive officers who are nominated by the Executive Committee and confirmed by the annual general meeting.

IATA is supported entirely by the dues paid by its members, who are assessed in proportion to the amount of international air traffic carried by each.

In practice, IATA is the agency through which the airlines seek to solve jointly those problems they cannot individually surmount and to do that work which can be carried out more effectively or economically by combined effort. It is active in the fields of traffic, finance, legal and technical matters, medicine, public information, and the like. In some cases, IATA acts as a central bank of information and technical knowledge for all member airlines; in others, IATA is preparing to publish tariffs and time tables; it conducts such enterprises as the IATA Clearing House; it administers committees of airline experts set up to deal with continuing problems; and it represents the airlines in their dealings with other international organizations.

The creating work of IATA is done largely by its four standing committees—Financial, Legal, Technical, and Traffic. Like the Executive Committee which nominates them, these committees and their subcommittees are made up of the best talent available in the member airlines. IATA's small secretariat administers the affairs of these committees, provides services for them, and carries forward their recommendations. Rules for the conduct of the committees are laid down, and their decisions are subject to final approval by the Executive Committee.

Chapter

11 * SAFETY IN AIR TRANSPORTATION

IN DEVELOPING any new means of transportation, the problem of improving safety is important. This is not new or peculiar to air transportation, since accidents are sometimes unavoidable with any agency of transportation. It has been said that "lack of safety is the price we pay for motion." In the early years of American railroad transportation, there were many bad accidents; and although steady progress has been made in safety, until at the present time American railroads have achieved an enviable safety record, there are still accidents. A similar evolution has been, and is, taking place in air transportation. The airlines are not yet as free from danger as our railroads, and it will be some time before they are; but there have been outstanding achievements in the development of safety in air transportation.

Safety in air transportation depends on many things, among which are: (a) proper equipment properly maintained; (b) pilot skill, intelligence, and psychology; (c) skillful dispatching and adequate flight control; (d) adequate airway and airport facilities; (e) adequate weather forecasting and reporting; and (f) the promulgation and enforcement of rules designed to promote safety. Domestic scheduled airline passenger fatalities, per 100 million passenger-miles, dropped from 4.5 in 1938 to 0.09 in 1954, while the same figure for scheduled international United States carriers dropped from 13.2 in 1938 to nothing in 1954, as shown in Table 33.

Nature of the Air Safety Problem

It is almost impossible to relate accurately the accident rate in air carrier operation to accident rates in other fields of transport. One can, of course, use the same ratios, but it is doubtful whether these ratios have the same meaning when applied to other fields of transport. To illustrate, a comparison of passenger fatalities per 100 mil-

TABLE 33
COMPARATIVE SAFETY STATISTICS, SCHEDULED AIRLINES, 1938-54
SCHEDULED DOMESTIC OPERATIONS
(U.S. Trunk, Feeder, and Territorial Carriers)

Year	Fatal Accidents	Passenger Fatalities	Crew Fatalities	Passenger-Miles Flown per Passenger Fatality*	Passenger Fatalities per 100 Million Passenger Miles*
1938	5	25	10	22,400,205	4.5
1939	2	9	3	83,927,533	1.2
1940	3	35	10	33,114,118	3.0
1941	4	35	9	43,063,944	2.3
1942	5	55	16	27,286,599	3.7
1943	2	22	8	75,951,578	1.3
1944	3	48	8	47,907,077	2.1
1945	7	76	11	46,746,305	2.1
1946	9	75	22	80,894,782	1.2
1947	5	199	17	31,696,899	3.2
1948	5	83	15	75,035,325	1.3
1949	4	93	11	76,032,710	1.3
1950	4	96	13	87,118,531	1.1
1951	8	142	24	77,111,993	1.3
1952	5	46	6	282,536,326	0.4
1953	4	86	15	178,346,047	0.6
1954	3	15	NA	NA	0.09†

SCHEDULED INTERNATIONAL OPERATIONS
(U.S. Carriers)

1938	2	7	10	7,601,860	13.2
1939	1	10	4	7,826,592	12.8
1940	0	0	0	.....	0
1941	1	2	0	84,261,841	1.2
1942	0	0	0	.....	0
1943	1	10	4	25,437,434	3.9
1944	1	17	0	18,737,317	5.3
1945	2	17	10	19,584,343	5.1
1946	2	40	12	28,150,765	3.6
1947	3	20	13	93,163,400	1.1
1948	1	20	10	98,089,700	1.0
1949	0	0	0	.....	0
1950	2	48	8	48,713,167	2.1
1951	1	31	9	88,223,032	1.1
1952	3	94	9	33,795,043	3.0
1953	2	2	0	1,782,710,000	0.1
1954	0	0	0	NA	0†

* Includes both revenue and nonrevenue passengers and passenger-miles.

† Estimated. NA—not available.

Source: CAA, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954); 1954 Figures, CAA Press Release of December 26, 1954.

lion passenger-miles for various classes of transportation is shown in Table 34.

Safety of the railroads as compared to scheduled air transport might perhaps better be compared by a ratio that would relate the

TABLE 34
COMPARISON OF PASSENGER FATALITIES

Kind of Transportation	1953 Death Rate Per 100 Million Passenger Miles	1951-53 Average Death Rate Per 100 Million Passenger Miles
Passenger automobiles* and taxis.	2.9	2.9
Buses	0.13	0.16
Railroad passenger trains	0.16	0.21
Scheduled air transport aircraft.	0.6	0.7

* Drivers of passenger automobiles are considered passengers.

Source. Compiled from *Accident Facts*, National Safety Council.

number of fatalities to the time spent in transport rather than to miles covered or to a combination of those two. The yardstick commonly used to measure safety in transportation is passenger fatalities per 100 million passenger-miles traveled, probably because this was the method established to measure railroad safety. This is a good criterion for railroads, because in a typical railroad accident usually only a small percentage of the passengers are killed. (When a fatal accident occurs, there is still a reasonable chance of survival.) Fatal accidents involving aircraft, however, usually result in a much larger percentage of occupants being killed, and so a better yardstick here is to reckon flying safety in the same terms as might a member of the flight crew. A pilot could not accurately measure his air life expectancy on the basis of passenger-miles because he rides whether or not passengers are being carried. He should reckon his exposure to fatality on the basis of pilot fatalities per hour or miles of exposure flown or per thousand hours or miles flown. The true standard of safety should be life expectancy, which for aircraft is more nearly akin to hours or miles one has left to live while flying, rather than so many passengers traveling so many miles. On the other hand, an index of public transportation safety must show the public (passenger) stake—it must answer the question, “What are his chances of survival?” In other words, how many passenger miles can he fly before the law of averages may involve him fatally? That is why the index of Passenger Rate per 100 Million Passenger Miles is accepted in this country and throughout the world for this purpose.¹

The completely proper measurement of safety for air transportation, however, has not yet been found, and further study of the problem is desirable. But whatever yardstick is selected, its principal use

¹ For a discussion of the statistical approach to the subject of air safety see Ben W. Ashmead, “The Statistical Trends in Air Safety,” a paper presented to the American Society of Mechanical Engineers, Los Angeles, Cal., June 28, 1953.

will be to determine trends rather than to assess exposure to accident, inasmuch as the airlines' record for safety is within the public concept and acceptance of safety in other fields of activity. Statistics, however, fail to make much impression on public consciousness.

Dramatic accidents occur and receive considerable publicity, and for that reason the public in general feels that air travel is much more dangerous than it really is. One reason for this is that the type of plane now employed by air carriers has a passenger capacity frequently double or triple that commonly employed by air carriers some years ago.

Another reason for the public attitude toward air safety is that it does not distinguish between accidents on United States certificated airlines and those in nonscheduled flying, in private flying, in military flying, or even on foreign-owned airlines outside the United States, which, incidentally, were 3 to 20 times as dangerous as United States certificated airlines during the latest period for which we have figures for most countries.

Aviation, which enjoys the fruits of tremendous publicity for its constructive achievements, also receives the same widespread publicity for its difficulties. All who are concerned with the future of civil aviation should welcome such publicity, for an aroused public opinion will help bring steps to improve aviation safety. If the public did not care about air safety, progress in this field would not be nearly as rapid as has been shown possible.

Until a few years ago, the industry was flying very few passenger-miles a year, so that the element of chance affected the figures for any one year enormously. An accident happening in December of one year rather than January of the next would change the unit safety record by as much as 30 to 50 per cent, and the only really fair indication of safety progress was the average safety performance over 3 to 5 years. When the industry was flying a billion passenger-miles a year, an accident with 20 people killed affected the safety record by a very large percentage, whereas now that airlines are flying between 18 and 20 billion passenger-miles, the element of chance does not have nearly the same effect on the year's record.

Good though the record of the certificated airlines is in relation to previous achievements, there is certainly no reason to regard it with complacency or even with satisfaction. Safety and regularity can, and must, be vastly improved if air transport is to realize its potential as a medium of mass transportation.

The speed with which safety and regularity are improved will de-

termine to a very large degree how rapidly the United States will reap the fullest benefit from air transport and realize the fullest return from its already substantial investment in airways, airports, and other civil aviation facilities. Our present air transport safety record would have been far better had not the modernization of our airways facilities—planned to begin on a large scale in 1941—been delayed for over four years as a result of World War II and the difficulties of reconversion. The important factors which will contribute to the rapid improvement of air safety seem to be the following:

1. The efficiency and ability of our transport companies.
2. The ability of pilots.
3. The sound design of our commercial aircraft.
4. The soundness with which our system of air navigation facilities is planned.
5. The speed with which technical improvements in air navigation facilities are introduced, which depends in turn on (*a*) the rate of technical progress, to the point where large-scale service installations are justified, and (*b*) the rate at which funds are provided for such installations.
6. The intelligence with which our safety regulations are framed.
7. The efficiency with which those regulations are administered.

Regularity of service is second only to safety. Cancellations of flights or delays or diversion to other than the intended destination are exceedingly costly. It has been stated that the airlines suffer a loss of about \$20 million annually due to loss of revenue from nonproductive equipment and personnel when planes are grounded, diverted, or delayed because of bad weather.

There are many factors affecting the safety of life and property in airline operation today. Inherent in the fundamental characteristics of air transportation is the indisputable truth that factors which in general would seem trivial can, with the right chain of circumstances, be the cause of a serious accident. By the very same rule, matters which seem to bulk large in the safety picture can, because of their general recognition and acceptance by all concerned, be relatively unimportant considerations in the safety of airline operation. In other words, it is the exception instead of the rule that causes the accident.

The present trend of trying to build airline safety through restrictive regulation is not only alarming to the airline pilot but also places an unnecessary burden upon his capabilities, which could far better

be expended upon a direct contribution to the safety of the flight under his command.

Under the present procedure, when an accident happens, many restrictions are often applied by the regulatory authority which have no bearing on the actual accident in question. It is a facetious saying among airline pilots that "if they want to make airplanes 100 per cent safe, why not pass a law making it illegal to take an airplane out of the hangar, and be done with it." What the airline pilots actually want is a more realistic approach to the problem. There has been, for example, too much comparison from a safety standpoint between military and naval operations and commercial operations. The control of traffic over New York in one day is forty times as complicated as flying a thousand or fifteen hundred bombers from England over Europe and back, because under wartime conditions the flow of traffic was parallel. All aircraft were either landing or taking off, and there were no take-offs while the landings were taking place. All aircraft were proceeding in one direction. In New York there are four commercial airports with aircraft coming from all directions and, in addition, through traffic. In other words, there is a meshing of traffic, much like a seine, with a large number of arteries or patterns of traffic flow; and it is not possible to segregate the various patterns. One aircraft cannot land at the expense of another.

Federal Regulation of Air Safety

The two federal agencies primarily concerned with promoting safety in civil aviation are the Civil Aeronautics Board and the Civil Aeronautics Administration.² Other agencies which have incidental and indirect responsibilities with regard to air safety are the Weather Bureau, the Coast Guard Service, the Air Coordinating Committee, and the National Advisory Committee for Aeronautics. Agencies such as the Air Force, Army, and Navy have also contributed greatly to the cause of air safety by making the results of their research and experience available to the civil authorities.

The Civil Aeronautics Board has two general functions in the field of air safety—that of promulgating appropriate regulations govern-

² Civil Aeronautics Act, Title VI. Prior to the enactment of the Civil Aeronautics Act, the power of safety regulation was exercised by the Secretary of Commerce through the Bureau of Air Commerce, which maintained a staff both in Washington and in the field. The act of 1938 brought about a fundamental administrative change affecting safety regulation in that it vested both safety and economic regulation in a single agency but conferred practically the same powers of safety regulation as had existed under the Air Commerce Act of 1926.

ing safety and that of investigating accidents. The Board is responsible for fixing the standard for such things as the issuance of airman certificates, aircraft types, airworthiness certificates, and a number of related matters. The Board is also responsible for promulgating aircraft traffic rules, fixing minimum standards for the operation of all classes of air carriers, and adopting such other rules and standards as may be necessary for the maintenance of safety in air commerce. The Administrator of Civil Aeronautics, on the other hand, is responsible for enforcing these rules and standards for the development and operation of the civil airways, and for such research as he is authorized year by year to undertake. Violations of safety rules are normally dealt with in one of two ways. The Administrator can bring an action against the offending airman or air carrier before the Board, and the Board has the duty of determining what disciplinary action it should take. The Administrator may also compromise minor violations of the rules by imposing a civil penalty.

From the above it will be seen that the regulation of air safety is a divided function, with the issuance of safety regulations in the hands of the Civil Aeronautics Board but their enforcement entrusted to the Civil Aeronautics Administration. This division of functions, however, is not as clear-cut in practice as it appears in theory.³ Regulations issued by the Board necessarily must be general in character. Frequently, they provide explicitly for the Administrator's exercising a delegated power to alter their particular provisions in order to meet local necessities or new situations. In addition, the problem of interpretation is always present; and, so far as air carriers are concerned, the supplementary power of the Administrator to issue operating certificates gives him an independent regulatory power. Such a division of functions invites difficulties that even the best co-ordination has trouble averting. Not only do problems arise as a result of independent sources of power dealing with the same questions, but the question recurs as to whether any delegated power has been exercised in accordance with the standards set forth. A degree of co-ordination in this respect was achieved when the Civil Aeronautics Board and the Civil Aeronautics Administration created an interdepartmental com-

³ See *Report to the President of the United States by the President's Special Board of Inquiry on Air Safety* (Washington, D.C.: U.S. Government Printing Office, 1947), Appendix IV; Edward C. Sweeney, "Safety Regulations and Accident Investigation: Jurisdictional Conflicts of CAB and CAA," *Journal of Air Law and Commerce*, Spring and Summer, 1950; Merrill Armour and Harley G. Morehead, Jr., "Analysis of Civil Aeronautics Board's Precedents in Safety Enforcement Cases," *Journal of Air Law and Commerce*, Winter, 1950.

mittee to whom all questions of this character are now referred. This committee has worked well, but at best it provides only interdepartmental coordinating machinery where the best answer might be that of a unified operation. Another difficulty is that of always determining just where responsibility lies for deficiencies in administration.

One example of interdepartmental co-ordination was the Board's delegation of the authority to investigate small plane accidents to the Administrator of Civil Aeronautics. This became effective January 1, 1954, after which time the Administrator had full responsibility for investigating accidents involving civil aircraft of less than 12,500 lbs. maximum take-off weight, and for releasing any reports thereon. The Board continued to investigate accidents involving all aircraft over that weight, accidents involving helicopters irrespective of weight, and accidents relating to small aircraft operated by carriers in Alaska holding certificates of public convenience and necessity.⁴

The test of effective regulations is, of course, their operation, and the need for more or less regulation is to be determined by appreciating the actual operation of the industry itself. Consequently, the agency with authority to issue regulations should be in close touch with operations and have a practical appreciation of the current needs and problems of the industry. The existing arrangement for federal regulation presents a further difficulty in this respect, for the agency responsible for issuing regulations, the Civil Aeronautics Board, has no field personnel save for its accident investigators. The Administration, on the other hand, has a large field personnel. To duplicate this staff, even in part, is unwise. Whatever data is collected must therefore be transferred from one agency to another. The regulatory authority is thus isolated to some degree from practical operations, except to the extent that it can afford to make its own specific investigations of subjects which for some reason give it special concern.

Investigation of Accidents

The investigation of accidents is of enormous importance, because it is by thorough investigations that we learn to correct previous errors. The reports issued after the investigation of an accident are studied with care not only in the air transport industry but also in the

⁴The Administrator does not hold public hearings on any of the accidents he investigates. If such a hearing is considered desirable by the Board, the Administrator, or any interested person, the Board notifies the Administrator that with respect to that particular accident the delegation of authority is rescinded. Thereafter, the accident is investigated by the Board, including the holding of a public hearing, if the Board deems such action desirable.

aircraft manufacturing industry. As a result of these investigations, improvements in design and operation often occur independently of any action that may be taken by either the Civil Aeronautics Board or the Civil Aeronautics Administration.

The Board cannot conceivably investigate every accident that occurs. It does, however, require the submission of complete reports on all accidents on a form prescribed and furnished by the Board. These reports are made the subject of study and analysis by its Accident Analysis Division. The policy of the Board with regard to studying accidents is to investigate the following types:

1. Air carrier accidents which result in serious or fatal injuries or which are potentially serious.
2. Accidents where mechanical failures of the aircraft have been contributory, including fire in the air.
3. Accidents involving collision of aircraft in the air.
4. Any other accidents from which it appears that important accident-prevention knowledge may be obtained.

The Board actively investigates those accidents that have involved the scheduled air carriers and the nonscheduled air carriers using large equipment, but such accidents comprise only 5 to 10 per cent of the total. Thus between 90 to 95 per cent of the actual accident investigations are carried out by the Civil Aeronautics Administration personnel. These include the large bulk of the accidents which are involved in private flying operations and in small nonscheduled operations plus all other minor accidents which may involve only a slight structural damage to the aircraft itself but which are of vital importance in determining ways to improve design and obtain correction of maintenance or other difficulties in the field.

Ever since the Air Safety Board was abolished under the Reorganization Plan of 1940 (as discussed in Chapter 4), there have been numerous attempts to re-establish such an "independent" agency.⁵

⁵ The Airline Pilots Association has been the most active organization responsible for these attempts. The Civil Aeronautics Board, the Civil Aeronautics Administration, and industry spokesmen have consistently opposed such a move. See "Safety in Air Navigation," *Hearings before the Committee on Interstate and Foreign Commerce, House of Representatives (80th Cong., 1st sess.)* (1947). On the other hand, the President's Air Policy Commission, created in 1947, recommended the appointment of an "independent" Air Safety Board. See *Survival in the Air Age* (Washington, D.C.: U.S. Government Printing Office, 1948) pp. 138-39. Early in 1954 Senator Pat McCarran introduced a bill (S 2647) which, among other things, provided for the establishment of an air safety board of five members, appointed by the President and confirmed by the Senate, with terms of six years and annual salaries of \$9,000. It stipulated that at least one member must be an airline pilot and one member a licensed private flyer. See Appendix B.

The argument most used in favor of this move is that it would concentrate the responsibility for safety in one place and do away with any temptation that might now exist, where the investigating agency is the same as the regulating agency, to incline against a too thorough self-criticism and to look elsewhere for any fault that might be found.

Those opposed point out that it is unnecessary to provide an independent agency to investigate air accidents, since the responsible agencies already charged with making safety regulations and with administering and enforcing them are well equipped and able to investigate and to take all necessary remedial action. Opponents of the move also maintain that establishing an agency similar to the old Air Safety Board to check on the responsible executive agencies would indicate lack of faith in their officials, suggesting that the agencies might suppress whatever facts tended to discredit themselves. There is, it should be noted, not a single instance on record showing such a suspicion to be well founded. If public hearings on all major air accidents are required by law, this should be sufficient to assure the public of a full and fair disclosure of all pertinent facts. It seems to be the consensus that these hearings, as under the present law, should be held by whatever agency or agencies are charged with the promulgation, administration, and enforcement of the safety rules and regulations. By so doing, the power to recommend is not divorced from the power to act, and unnecessary duplication of personnel engaged in the same activity is avoided.

The manner in which investigations have been handled in the past should not be criticized lightly. The work has been painstakingly thorough and the results worthwhile. There are two suggestions, however, which might make possible even improved results.⁶ In the first place, the attention of investigators is too frequently limited to the probable cause of an accident; this, of course, is important, but the causes of major accidents are rarely simple, nor is their correction an easy matter. Behind the final cause—usually the last circumstance that is designated as the probable cause—lies a chain of events that precipitated a situation in which it was possible for the last circumstance to occur. The investigation of an accident should not focus on the last happening, but must rather evaluate the entire situation. It must, if possible, bring forth recommendations that will not only insure against the recurrence of the particular accident, but will prevent other potential accidents which might be caused by the existing

⁶ See *Report to the President of the United States by the President's Special Board of Inquiry on Air Safety, 1947.*

hazards that the investigation reveals. Errors are always possible in the operation of aircraft; the most important goals are lessening the chance of error and planning ways to make errors, when committed, less costly.

This approach calls for more than mere investigation. It demands a constant scrutiny of the entire field and the planning of remedies to correct whatever hazards are found to exist. This points to the second way of improving the process of accident investigation, namely, providing that the study of investigative results, as well as the planning and conduct of the investigation, be conducted always at high levels. The Board, as such, has not always been able to do this. As originally constituted, its prime objective has been to regulate the economic phases of air transport, and its chief energies have therefore been devoted to that task. An equally concentrated approach to the problems of air safety might produce as comprehensive and productive results as those already achieved in regulating the economic phases of the industry.

Causes of Air Accidents

No matter what the rules and precautions, accidents will occur. The causes are many. Mechanical failures will happen, no matter how careful the inspections and tests by manufacturers and airline maintenance forces and no matter how careful the flight crew and ground personnel. The modern aircraft contains thousands of vital parts, many of them at once intricate, delicate, and required to function under violent stresses and fantastic changes in temperature. Human error will creep in; and in nearly every case had one less error been committed, the accident probably could have been prevented. The remarkable thing is not that some accidents occur but that they occur so seldom.

Over the years, the Civil Aeronautics Board has ascribed more accidents to failure on the part of airline personnel than to any other cause. (See Table 35.) More often than not, individual accident reports list such personnel errors as "pilot error." In fact it may be said that pilot error runs through all the other causes, i.e., terrain, weather, or structural failures, or power plant failures—less in the latter than in the former. Pilot error is a very difficult thing to describe, and one must not confuse pilot blame and pilot error. All human beings are subject to human frailty, and they may fall down on the job. It is not the blame of the pilot. It means, however, that it is incumbent on the Civil Aeronautics Board and Civil Aeronautics Ad-

ministration to see that training programs and selection requirements for pilots are the best that our techniques and knowledge up to this stage can devise.

TABLE 35
CAUSES OF AIR CARRIER ACCIDENTS, 1949-53

	NUMBER OF ACCIDENTS					PER CENT DISTRIBUTION				
	1949	1950	1951	1952 ¹	1953	1949	1950	1951	1952 ¹	1953
Scheduled and irregular carriers: ³										
Personnel	69	58	54	59	46	52.3	60.4	46.2	53.6	41.8
Aircraft and equipment.	37	22	33	25	21	28.0	22.9	28.0	22.7	19.1
Airport terrain and weather	14	13	26	18	22	10.6	13.6	22.2	16.4	20.0
Miscellaneous	12	3	4	8	21 ²	9.1	3.1	3.4	7.3	19.1
Total	132	96	117	110	110	100.0	100.0	100.0	100.0	100.0

¹ 1952 air-carrier figures have been revised to reflect completed cases.

² Includes those cases still in process.

³ Includes Alaskan carriers.

Source: Civil Aeronautics Board, *Annual Report, 1953*.

Airline pilots, being human, naturally make mistakes occasionally, and sometimes the results are serious. However, the flat verdict "pilot error" should not be applied to any accident without first taking all extenuating circumstances into consideration and also a complete appreciation of the fact that, when an airplane departs, the pilot automatically assumes the ultimate responsibility for all mistakes made by practically everyone else in connection with the flight.

Thus, if a careless agent loads the aircraft improperly so that it is completely out of balance, the pilot must absorb this error and quite often do so on a difficult instrument procedure which could, under many circumstances, be problem enough with a properly loaded airplane.

If a mistake is made in dispatching, choosing of alternate airports, estimating the fuel necessary for a given weather condition, or many similar instances, the pilot must either catch the error at its source, which is invariably difficult and frequently impossible, or absorb the emergency created by the errors of the other departments when the situation develops.

If a mechanic makes a mistake in engine maintenance or overhaul, not only will the pilot eventually have to handle an engine out—or adopt what is known as "single-engine procedure"—but it is entirely possible that he may have to conduct the emergency in a severe

frontal or squall condition that was completely missed on the weather forecast issued by the meteorology department.

The failure and malfunction of ground facilities, such as radio ranges, two-way voice communications, airport lights, etc., are additional burdens upon the pilot at frequent intervals.

Airline pilots have no desire whatsoever to dodge or avoid any of this final responsibility. However, they do emphatically feel that the interests of airline safety would be better served if investigating agencies would concentrate on a proper evaluation of all extenuating circumstances and contributing factors instead of coming out with the flat announcement of "pilot error," which thereby absolves the many agencies, and departments, and everyone else that has contributed to the cause of the accident.

Although structural and power plant failures are not now the major problem they were in the early days of air transportation, such mishaps do occur often enough to be significant in the "cause of accidents" summary. As new aircraft and new power plants come into use, a great deal of research is required to provide the knowledge necessary to achieve satisfactory safety standards. For example, in jet power plants there is still much to be learned before materials are completely satisfactory and integrity can be assured. New alloys for aircraft construction call for extensive study and experimentation, particularly in fatigue and corrosion resistance.⁷ Studies of this type should give assurance that tomorrow's aircraft should be safer than those of today.

The occurrence of fires in the air is another item that calls for attention. Although they occur but seldom, at least in the well-proved aircraft, and are not listed by the Civil Aeronautics Board as a distinctive cause of accidents, their effect is so terrifying and results so severe that they are a matter of prime importance.⁸ The problem itself is difficult of solution because equipment must be so compact and because, in aircraft, the amount of fuel handled and the rate of energy release is so much greater per unit of volume than is any other transportation device. A better method of extinguishing fires when they occur is needed. Carbon dioxide and methyl bromide are being used, but both have serious shortcomings. A paramount need is a really satisfactory fire detector. None has yet been developed which has the desired reliability. Too frequently, fire detectors fail to operate, or

⁷ See C. C. Furnas, "Research for Aircraft Safety," *Aeronautical Engineering Review*, July, 1949.

⁸ It has been estimated that about 5 per cent of air carrier accidents are caused directly or indirectly by fire in flight. *Ibid.*

they give a warning when no fire is occurring. Either situation obviously tends to detract from their effectiveness.

Considerable research has been performed on nonflammable lubricating oils, but the results thus far are not hopeful. More success has been had in developing nonflammable hydraulic fluids. Several of these bear considerable promise for utilization in the near future.

The exploration of so-called "safety" fuels is potentially fruitful but has not resulted in any phenomenal advances as yet. It must be remembered that fuel is, by definition, something that will burn; and, hence, there are certain conditions of temperature, exposure to oxygen, and any source of ignition which will make it a fire hazard. Although it is conceivable that a fuel could be developed which would burn only under conditions found inside an engine and under no combination of conditions which could be found outside, there appears to be little real hope of complete success along this line.

Bad weather is an important cause of air accidents, and it has been made much more difficult to overcome because of the increasing requirements for all-weather operation in the air transport industry. With the present integrity of aircraft, if flying operations were confined to fair weather, the accident record would probably be of much smaller proportions. Although many airline accidents are attributed to pilot error, the bulk of these are really attributable to emergency situations, arising during poor weather conditions, which human beings cannot reasonably be expected to handle. It has been estimated that, if these emergencies based on weather were eliminated, about 40 per cent of the present accidents would never happen.⁹ Probably an adequate solution lies in the various electronic devices with suitable adjuncts which will give a requisite amount of intelligence and a proper degree of communication and control. (See Chapter 2.)

The Content of Safety Regulation

Regulations as such cannot alone bring about conformance to safe operating procedures and standards. Indeed, an effort must be made to keep regulations at a minimum so as to avoid confusion and disorder. The prime responsibility for the observance of good operating procedures must be placed upon the air carriers themselves. The Board has consistently followed this policy, but in doing so has sought advice and suggestions from the operating personnel of the air transportation industry.

⁹ Jerome Lederer, "Loss Prevention Programs in Civil Aviation," *Aeronautical Engineering Review*, July, 1948.

As time has gone on, two factors have evolved in connection with safety regulation. The first is that the growing knowledge of the nature of air transport permits the Board to move from rules to the writing of standards. This is a natural development that has taken place in many related fields. Portions of the Civil Air Regulations, which started off frequently as special solutions for certain situations, have already been revised, with some details being eliminated.

The second factor is the maturing of the industry itself. The air transport industry is probably more conscious of the significance of clean, safe operations than is anyone else. It is showing this consciousness in its research activities and its general organization to bring about that end. This enables the government to delegate more and more of its detailed responsibilities in this connection to the industry. Examples of this are to be found in the devising of air carrier maintenance certificates and technical standard orders. This does not mean that the government should neglect or abrogate its responsibilities, but it does mean that government should be able to content itself with specifying the broad objectives that must be met and leave to industry the manner in which it will choose to meet those standards. In the fields of airworthiness standards, fire prevention, auxiliary devices, and even operations, much can be done along this line. And so long as the industry keeps its sense of responsibility, the resulting simplification will provide both safety and greater flexibility in development.

Our national policy regarding aviation safety was outlined by the Air Coordinating Committee as follows:

(1). The Federal Government's paramount objective in the field of aviation safety shall be to assure the highest practicable degree of safety in civil aviation. In the fulfillment of this objective all appropriate United States government agencies shall cooperate in fostering and encouraging safety concepts and in the removal of technical, administrative and political obstacles to the safe and orderly development of domestic and international civil aviation.

(2). The advancement of aviation safety shall continue to be regarded as a cooperative effort of government and industry. An effort designed to contribute both to the national welfare and to the continuing best interests of the civil aviation industry itself.

(3). The government should continue the trend toward (1) safety rules and regulations which prescribe the particular objective sought rather than the means by which it is attained and (2) curtailment of the supplementary directives of a mandatory nature. Safety rules and regulations should be drawn so as to reduce to the greatest degree compatible with safety the administrative burden on both industry and government attendant upon their implementation and enforcement.

(4). As a corollary to these policies, the air carriers, manufacturers and

other industry organizations must assume primary responsibility for assuring adherence to safety standards within their organizations. The governmental safety authorities should hold management accountable for company-wide compliance with safety standards, rules and regulations, and should emphasize dealings with company management to secure desired improvements in safety.

(5). Because of the large number and dispersion of individuals and organizations associated with general aviation, such as private flyers and other non-air-carrier operators, the Federal safety authorities must in the interest of efficiency devote their major attention in the general aviation field to those organizations and individuals that have the greatest potential effect upon safety, such as aviation schools, repair stations, other individuals and organizations the scale or character of whose activities warrants special attention, and to the designees who have been delegated governmental examining and inspectional responsibilities. The policy of utilizing designees who are not on the federal payroll to perform the great bulk of examining, certification, and inspection work with respect to individual aircraft and airmen shall be continued.

(6). The governmental safety authorities should devote increasing emphasis to singling out and attacking the really key factors and problems that have the greatest impact upon the safety of air operations. This will involve statistical and other investigations to isolate major safety and hazard-generating factors in aircraft, airmen, operations, and facilities; the solicitation of the opinions of industry and aviation organizations in the nature of such problems, and their cooperation in developing solutions; the pooling of the results of research and experience bearing upon these problems; and the open-minded exploration of fresh approaches to their solutions.¹⁰

*Airline Liability and Insurance*¹¹

Certificated airlines are common carriers and as such are required to use the greatest care, vigilance, and caution consistent with the practical operation of aircraft.¹² However, passengers by air must assume all the usual and ordinary perils which are incident to that type of travel and which may exist over and above the perils which a common carrier, under its legal liability, must guard against.¹³ In one case the court held:

¹⁰ Air Coordinating Committee, *Civil Air Policy* (Washington, D.C., 1954).

¹¹ See G. O. and L. G. Dykstra, *The Business Law of Aviation* (New York: McGraw-Hill Book Co., 1946), Parts III and IV; Charles S. Rhyne, *Aviation Accident Law* (Washington, D.C.: Columbia Law Book Co., 1947); G. L. Wilson and L. A. Bryan, *Air Transportation* (New York: Prentice-Hall, Inc., 1949), chaps. xxi and xxiv.

¹² This theory has been upheld numerous times by the courts, which have usually distinguished between the standards required of common carriers and those imposed by law on private or contract carriers. See *Wilson v. Colonial Air Transport, Inc.*, 278 Mass. 420 (1932); *Foote v. Northwest Airways, Inc.*, 1931 U.S. Av. R. 66 (1931). In one case, however, the court held the airline liable for only ordinary care. See *Greunke v. North American Airways Co.*, 201 Wis. 565 (1930).

¹³ *Allison v. Standard Air Lines, Inc.*, 1930 U.S. Av. R. 292 (1930).

In an airplane accident the limitation of responsibility may be said to consist of a plane in good mechanical condition, handled by a careful pilot, maneuvered in a careful way under conditions that, so far as can be foreseen and overcome by the use of ordinary skill, such as unfavorable weather conditions, so that the ordinary pilot could observe them as such.¹⁴

The general rule of proof is that the mere occurrence of an accident does not, in itself, raise a presumption of negligence on the part of a common carrier by air, despite the fact that the carrier is charged with the duty of exercising the highest degree of care in protecting its passengers and cargo.

Common carriers of goods by air are subject to the same general rules applicable to other forms of transportation. That is, they are held generally liable for loss or damage of goods while in their custody and are responsible for the safe transportation and proper delivery of the goods to consignees, except for loss or damage caused by acts of God, acts of the public enemy, or other excuses for failure to transport and deliver which are recognized by the common law or applicable statutory law. The Railway Express Agency in conducting its air express service uses an air express receipt which provides, as does the uniform express contract used in the railway express business by land and water routes, that the liability of the carrier is limited in consideration of the rate charged for the transportation service. This rate is dependent upon the value of the property and is based upon an agreed valuation not over \$50 for any shipment of 100 pounds or less and not exceeding 50 cents per pound, actual weight, for any shipment in excess of 100 pounds, unless a greater value is declared and stated in the receipt. Wilson and Bryan state that, while "there is little statutory or case law in claims for damage to express and baggage as the result of aircraft accidents," the courts "are almost certain to apply the usual common law rules holding the common carriers as insurers of the goods" subject to the usual exceptions provided for other types of carriers.¹⁵

Rules for air carrier accident liability in international air transportation are prescribed by the Warsaw Convention adopted in 1929, to which the United States is a party. This provides, in substance, that the air carrier shall be liable for damages sustained by (a) death or injury to the passengers; (b) destruction, loss, or damage to baggage or goods; and (c) loss resulting from delay in the transportation of passengers, baggage, or merchandise. The Convention provides that,

¹⁴ *Seaman v. Curtiss Flying Service, Inc.*, 1929 U.S. Av. R. 48 (1929).

¹⁵ Wilson and Bryan, *op. cit.*, p. 413. See Chapter 17 for a more detailed discussion of airline liability for air cargo and insurance coverage.

for passengers, liability cannot be escaped unless the carrier proves that he or his agent took all necessary measures to avoid the damage or that it was impossible to take such measures. In the case of baggage or goods, the carrier can successfully defend any claim for damage if he proves that the damage was caused by an error in piloting, in the handling of aircraft, or in navigation and that he or his agents had taken all necessary measures to avoid the damage. Wilson and Bryan point out that "there have been few court decisions under the Warsaw Convention" but that the leading American case holds that "no new substantive rights were created by the Warsaw Convention, and all the rules laid down are well within the framework of the existing legal rights and remedies."¹⁶

In 1949 the Civil Aeronautics Board began a basic study and review of the tariff rules and airline practices relating to the liability of air carriers to the traveling and shipping public, and particularly to limitation of liability and procedures for making and collecting claims for damage and/or injury.¹⁷ The Civil Aeronautics Act is silent on these matters, in contrast to the Interstate Commerce Act, which sets forth liability provisions in detail. The Board's investigation may bring about the issuance of tariff regulations stating its policies, requirements, and restrictions in this field and may even result in Board recommendations for special legislation to fill the gaps in the Civil Aeronautics Act. There appear to be now no legal restrictions on tariff provisions which limit the carriers' liability to the public in domestic service or in service to our possessions, termed "overseas" service by the Act. Board and industry officials have felt that this may be a cause of confusion among members of the traveling and shipping public, who are inclined to apply to air transport those standards and practices regarding liability which are well established with rail and other forms of transportation.

Insurance is an important part of air transportation, as it is of all commercial enterprise. Airlines buy insurance to protect their investment in aircraft and other equipment against numerous and varied risks. Bankers financing the purchase of aircraft and other equipment

¹⁶ *Ibid.*, p. 416. Also see *Wyman and Bartlett v. Pan American Airways, Inc.*, 1943 U.S. Av. R. 1 (1943). One of the major provisions of the 1929 Warsaw Convention sets the maximum liability an airline may have for each passenger in case of bodily injury or death during an international flight at \$8,291 (U.S.). There is also a maximum of \$16.58 for each kilogram of checked baggage and cargo, and \$331.67 for any possessions the passenger carries with him. (This limitation of liability does not exist if the damage was caused by wilful misconduct on the part of the carrier.)

¹⁷ CAB Order E-3183 (1949). The inquiry was broadened in 1950 by CAB Order E-4680.

require that it be insured. Shippers and bankers financing shipments also demand the protection of insurance for their goods while in transit. Liability insurance serves also to meet liabilities to persons suffering financial loss from personal injury and property damage inevitably resulting from accidents in the use of any medium of transportation.¹⁸ As of June 8, 1950, there was no certificated United States airline which carried insurance coverage of less than \$40,000 per passenger and not less than \$150,000 per accident. With respect to airline liability to persons on the ground who were not passengers, none of the certificated airlines carried less insurance coverage than \$50,000 per person and \$500,000 per accident. With respect to public liability for property damage on the ground for third persons, no certificated airline had insurance coverage of less than \$500,000 per accident. These figures represent the least carried by a certificated airline, including the smallest. The average airline carries much higher limits; for example, one middle-sized airline carries insurance of \$75,000 for each passenger and \$2,000,000 for each accident, and with respect to its liability to persons on the ground it carries insurance coverage of \$100,000 per person and \$1,000,000 per accident. To cover its potential liabilities for damage to property on the ground, this same airline carries insurance of \$1,000,000 per accident.¹⁹

The group plan of underwriting has been the manner in which aviation insurance has developed in this country. The two underwriting groups which dominate the domestic aviation insurance market are Associated Aviation Underwriters and United States Aviation Underwriters, Inc. This plan, which spreads any given risk among a number of companies, was evolved in part as answer to the unfortunate financial experience of several insurance companies which undertook to write aviation insurance individually in the 1920's. Under the group plan, several insurance companies authorized to write a similar line of insurance, such as fire insurance, for example, mutually agree to divide among themselves, in specified proportions, all of their aviation insurance business. To facilitate the administration of their undertaking, the several insurance companies designate an organization to have the exclusive management of the underwriting of all aviation risks assumed by each company. Similarly, a group of insurance companies authorized to write casualty insurance agree

¹⁸ See Civil Aeronautics Board, *A Study of Aviation Insurance* (Washington, D.C., 1944).

¹⁹ See Statement of Stuart G. Tipton before the Committee on Interstate and Foreign Commerce of the House of Representatives, June 16, 1950.

among themselves to share all their aviation risks and designate as the exclusive underwriting manager, for their aviation business, the same organization which handles the underwriting activities for the fire insurance companies.

The underwriting groups provide a wide range of coverage for aeronautical risks, but all coverage falls broadly into two categories—airline and nonairline. The airline category includes all forms of insurance which the underwriting groups write for the scheduled airlines.²⁰ Coverage for the airlines is divided into hull and liability insurance. Hull insurance, which is written by fire insurance companies, is intended to cover all the hazards pertaining to the aircraft and other airline property, such as fire and lightning, wind storm, tornado and cyclone, mooring (seaplanes), theft, perils of the air, or crash and land damage. Liability insurance, which is written by the casualty companies, covers the air carriers against liability to passengers, employees, and third persons and against liability for damage to property, including such risks as public liability, passenger liability, property damage, airport and hangar keeper's liability, baggage and cargo liability, and workmen's compensation.

Nonairline insurance is chiefly of the following types: (a) industrial, covering the industrial enterprises owning their own aircraft to transport persons and property in connection with their business; (b) flying services, such as the fixed-base or aircraft service operator giving flying instruction and conducting sightseeing and other charter operations; (c) private pleasure, covering persons who use aircraft for pleasure and other noncommercial purposes; (d) manufacturers, including the producers of aircraft and aircraft parts who purchase not only liability and workmen's compensation coverage but also liability insurance (the latter covers the manufacturer against liabilities arising from handling, use, or condition of aircraft after the manufacturer has made delivery); (e) airport operators who insure against liability to third persons; and (f) accident insurance for individuals or groups who fly as passengers or pilots.

²⁰ Airline and nonairline purchasers also carry insurance other than that furnished by the two groups specializing in aviation insurance. Examples of such other coverage are bonding insurance and fire and liability insurance on buildings and automobiles. Eastern Air Lines reported that, for 1948, it spent \$2,600,000 on insurance premiums, a figure equivalent to the company's revenues from air cargo and air express combined. See *Eastern Air Lines Great Silver Fleet News*, November–December, 1949.

Chapter

12 * FINANCING AIRLINES

UNTIL the close of World War II, the capital requirements of the air transport industry were met primarily through the sale of capital or common stock, generally referred to as "equity financing." The requirements of the industry for capital were small at that time, both in absolute terms and relative to the investment which has taken place since the war. Moreover, the industry was regarded as intensely speculative and there were few fixed assets on which money could be borrowed through the issuance of such securities as mortgage bonds.

The situation changed rapidly in the first few years after the war and, as shown in Table 36, the total capital structure of the domestic

TABLE 36
AIRLINE LONG-TERM DEBT IN RELATION TO CAPITAL STOCK
AND TO NET WORTH, 1946-50
(Thousands of Dollars)

	1946	1947	1948	1949	1950
DOMESTIC TRUNK AIRLINES					
1. Long-term debt	\$ 90,098	\$161,717	\$172,625	\$148,017	\$135,842
2. Capital stock	92,897	126,622	128,457	130,854	123,469
3. Long-term debt plus capital stock	182,995	287,793	301,082	278,871	259,311
4. Net worth	180,906	178,872	195,829	224,136	255,292
5. Long-term debt as per cent of line 3	49.2	56.0	57.3	53.1	52.4
6. Long-term debt as per cent of line 4	33.2	47.4	46.9	39.8	34.7
INTERNATIONAL AIRLINES					
1. Long-term debt	69,308	65,143	92,809	43,100	41,250
2. Capital stock	16,665	7,665	7,665	12,562	10,766
3. Long-term debt plus capital stock	85,973	72,808	100,474	55,662	52,016
4. Net worth	50,987	49,387	56,874	113,643	99,618
5. Long-term debt as per cent of line 3	80.6	89.5	92.4	77.4	79.3
6. Long-term debt as per cent of line 4	57.6	56.9	62.0	27.5	29.3

Source: Air Transport Association.

and international trunk airlines increased from \$160 million in 1946 to \$267 million in 1948. Between 1946 and 1950 the industry brought about a reduction in the relationship between debt capital and equity capital of from 57.3 per cent to 52.4 per cent, excluding surplus. With surplus included, the reduction was from 46.9 per cent to 34.7 per cent. A less healthy development, however, was that, during the same period, long-term debt (debt capital) increased in comparison to capital stock (equity capital).

The postwar trend to debt financing has been held by some authorities to have been far more pronounced and rapid than either necessary or desirable.¹ Some of the airlines failed to take advantage of the favorable market for their common stock which occurred during and immediately following the war; and, in 1946, the equity market, particularly for airline securities, collapsed. Unfortunately, it was approximately at this time that many of the carriers were in greatest need of new money to complete their programs of conversion to new equipment. In consequence, a number of the airlines were forced to resort to long-term borrowing to meet current needs as well as to keep abreast of aeronautical advances.

The increase in debt has serious implications not only for the immediate future but, more important, in connection with the ability of the airlines to face economic fluctuations. Obviously, if the industry and the Civil Aeronautics Board have done their job in accordance with the general requirements and responsibilities of the Civil Aeronautics Act, a substantial part of the industry should be able to weather reasonable economic fluctuations as they may occur. If, on the other hand, the financial structure of the industry is such that it endangers continued operations in the face of a general economic decline, it may be properly said that the air transportation system is not soundly financed. The danger in the present amount of long-term or funded debt is that it imposes relatively heavy fixed charges on an industry whose margin of revenue after operating expenses has fluctuated from time to time and, on the average, has been low.

The business of air transportation is highly sensitive to changes in the volume of traffic. Its operating ratio, which represents the relationship which operating expenses bear to all sources of revenue, is high. For example, the Class I railroads typically show an operating ratio of about 75 per cent. In air transportation, an operating ratio of 90

¹ See statement of Joseph J. O'Connell, Jr., then Chairman of the Civil Aeronautics Board, before Senate Committee on Interstate and Foreign Commerce in "Airline Industry Investigation" (81st Cong., 1st sess.), April 11, 1949.

per cent, or even slightly higher, would be considered quite satisfactory. The other important consideration, apart from the ratio itself, is the extent to which costs can be promptly adjusted to changes in the volume of traffic. Even though a very large part of airline expenses are variable, others are relatively constant. For example, depreciation must be accrued regardless of whether the individual aircraft is flying. The salaries of both flight and ground personnel are the same whether 50 per cent or 75 per cent of the seats are occupied by paying passengers. Even a reduction in schedules does not result in a proportionate decrease in cost since the same number of aircraft and other facilities must usually be maintained.

The air transport industry, therefore, not only has a high operating ratio but has a large proportion of expenses which do not vary directly with the volume of business. Thus, operating income fluctuates widely as a result of even small increases or decreases in traffic. In describing this condition, one might say that the airlines have a high break-even point; this is one of the most important characteristics of the business. When an airline goes into debt, it assumes fixed charges which serve to increase even further the proportion of constant expenses. Large-scale borrowing, therefore, has the effect of raising the high break-even point to an even higher level and of accentuating the instability of earning power. This undesirable development can be avoided, however, by financing with preferred and common stocks, which do not add fixed charges.

Ideally, therefore, an airline might be capitalized entirely with common stock; but, to be more realistic, one must recognize the need for intermediate debt financing of equipment purchases. The introduction of new types of equipment in the industry means that at any time an airline may find it necessary and desirable to replace a substantial proportion of its fleet. This replacement requirement, an instance of which has occurred since the end of World War II and which seems to be something that will continue indefinitely, can be soundly financed by serial notes or the equivalent of equipment trust certificates which are paid off during the life of the new equipment. The financing programs of a number of airlines have been designed along these lines, with serial notes financing about two-thirds of the equipment purchase programs and equity money providing the working capital and the investment in ground facilities required for the large expansion in service which is to be expected in the future.

Financing Equipment Purchases²

Assuming that modern all-metal aircraft do not wear out because the continuous process of rebuilding is a part of airline maintenance procedure, the main interest of those asked to aid in financing equipment purchases is the question of obsolescence and the possible use of the equipment on the same or other airlines should the borrower default.

The development of an airplane requires three years or more from its conception to the earning stage. New developments are taking place continuously, but such developments do not come about at one time. Turbine and jet propulsion, for example, may revolutionize aircraft power and eventually, either in conjunction with reciprocating engines or in substitution for them, render obsolete all aircraft now in existence or in the developmental stages. But a change of so radical a nature should not jeopardize loans on equipment in the meantime, if such loans are made for a fairly short period of time. Furthermore, the reduction of such loans by regular annual payments (amortization) should be carried out while new types are being substituted for existing equipment.

The period over which an equipment loan should be paid ought to be based as far as possible upon a forecast by the airline of the actual figures and not arbitrarily made to fit some other period of time. Heretofore, loans on airline equipment have usually been made to run from three to five years. The equipment more recently bought is being amortized by the airlines over a period of seven years.³ In any event, the annual payments should be arranged so that 100 per cent of the loans on the equipment would be paid off within the period in which the operator writes the original book value down to the allowed nominal residual value.

² See *Airline Finance*, a report by Bankers Trust Co., Mutual Life Insurance Co., Chase National Bank, and New York Trust Co. (New York, 1945); Frederick E. Hines, "Legal Difficulties in Secured Airline Equipment Financing," *Journal of Air Law and Commerce*, Winter, 1948.

³ A survey of depreciation time periods for transport aircraft owned by United States' airlines made by the Air Transport Association shows that most operators write off their newer aircraft in seven years. The survey shows seven-year depreciation for the Boeing 377 Stratocruiser and the Douglas DC-6. American Airlines amortizes its DC-6Bs in five years, but other airlines depreciate this airplane in seven years. American Airlines and National Airlines agree on seven years for the DC-7. The Lockheed 1049 Constellation is depreciated in four years by Eastern Air Lines and seven by Trans World Airlines; the same is true for the Martin 4-0-4. All airlines take seven years on the Convair 240 and 340. The Douglas DC-4 shows the greatest variance—American Airlines and Capital Airlines show five years, Northwest Airlines three, and Eastern Air Lines one.

The prospective lender is apt to question what disposition he would make of modern aircraft in case of default of his loans. The assumption is that such equipment would be operated for the lender by the receiver (or his modern counterpart, the trustee) of the airline and that the owner of the equipment would be in a favored position in dealing with the receiver for the airline.

If the airline is to continue in operation, the question of disposal of equipment probably will not arise. However, in case of abandonment,⁴ the problem is less easy to solve. The tendency is for each airline to select its planes and other equipment to meet the specific needs of particular traffic, so that, in order to dispose of repossessed aircraft and parts without loss, it would be necessary to find another airline operating under similar conditions and needing additional equipment.

The most important factor effecting equipment loans will, no doubt, prove to be the lender's confidence in the ability of the particular airline to utilize the equipment that is being financed on a profitable basis under the conditions met with by the individual operator. Probably the resale value of the equipment would prove to be of much less importance, even though in principle its value would always be larger than the outstanding amount of the loan.

The real protection derived by the lender will be based on the position his security interest in the airline's flying equipment gives him in case of receivership, so that he can promptly work out an arrangement with the receiver for the continued operation of the equipment, predicated upon the payment of interest and amortization in accordance with his contract. Banks and other lenders seem to feel that an airline should have an equity of somewhere between 20 to 30 per cent in each airplane at the start, depending upon the type of equipment and the credit of the operator.

It has been suggested that the operator's equity in the aircraft themselves might be decreased if a lien were obtained on spare engines, propellers, and parts. When an airline purchases a new fleet of aircraft, it is essential to buy spare engines and spare parts in sufficient number to permit replacement of engines for overhaul and replacement of parts of both aircraft and engines. Also these must be purchased in adequate number to permit distribution at points along the airline's routes. These spares are absolutely essential to permit the

⁴It is almost inconceivable that an airline, possessing a permanent certificate of convenience and necessity issued by the Civil Aeronautics Board, would ever be entirely abandoned. The same is not true of temporarily certificated carriers, several of which have already gone out of business.

economical and safe operation of aircraft, but they substantially increase the expense of a new fleet.

Depending upon the number and type of airplanes to be purchased and the length and kind of the routes involved, it has generally been found that about 25 per cent of the cost of the aircraft themselves should be spent for spare parts. In addition, the airline should maintain the spare-part inventory in virtually its original condition through all but the final stages of the life of this particular type of aircraft. Airlines are able to give valid liens both on aircraft and on inventories of essential spare parts. The Civil Aeronautics Act requires the Civil Aeronautics Administration to keep a register of such liens.⁵

Payments on loans made to finance new aircraft usually begin three to six months after the start of the earning life of the equipment, since there is always a time when it is being used for training crews, etc., and has not yet started to produce any revenue. For this reason, and also because deliveries of aircraft called for by sales contracts are usually spaced at intervals of several weeks or months, the loan should, except in unusual instances, be so arranged as to apply to individual airplanes.

The fleet of each airline should be covered by insurance against crash and destruction through other causes. Although in the past, when individual aircraft cost less and hence were depreciated more quickly, it has been the policy of some airlines to self-insure, such will not generally be the case in the future. In isolated cases, airlines have followed the procedure of insuring a number of aircraft not identified, rather than each specific aircraft. It appears that no fixed rule on insurance can be laid down. Any arrangement which provides for proper protection to the lender and to the borrower would probably be satisfactory. It seems reasonable for lenders to require that adequate insurance be carried on the fleet, at least to the extent of the loans.

Airline equipment loans have been based on conditional sales contracts, equipment trusts, and chattel mortgages; and although the last form has been used most often, it has not become the definitely established form. There are probably two reasons for this situation: lack of precedent and lack of clearly defined advantages for any one type. There may also be a difference in the relative advantages of the various forms of loan instruments between equipment for use wholly

⁵ Civil Aeronautics Act, sec. 503, amended by Public Law No. 692 signed June 19, 1948, as to engines, propellers, and spare parts.

within the United States and equipment for use in foreign operation.

Under equipment trust financing, a bank or group of banks lends the required money for the purchase of new equipment; but the title remains in the banks, who are the trustees of the series of certificates issued with the equipment as security. The equipment trust certificates are owned by the banks doing the financing and are held by them or sold to investors who hold them until maturity. The certificates mature serially, so many each year; and the company operating the equipment pays enough each year to retire a series of the certificates and to pay interest on those remaining in the hands of banks or investors. The virtue of this type of financing rests in the fact that, as each annual payment is made, the equity behind the remaining certificates becomes greater, since the entire lot of equipment is security for the entire issue of certificates until all are paid off.

The chief difference between equipment trust financing for railroads and airlines is that the period to final maturity for railroad equipment trusts extends over ten or fifteen years, whereas for new aircraft the term would probably be limited to ten years. The principle involved is the same, i.e., payments by the operating company will retire, during the useful life of the equipment, the entire amount of the securities issued. The historical record of railroad equipment trust certificates is such that this type of security is regarded highly by investors.

Chattel mortgages are considered more suitable for airline use than for railroads because airlines do not, as a rule, have general mortgages containing "after-acquired property" clauses. Railroads commonly have such mortgages; and if they purchased equipment and took title thereto, the equipment would fall into the "maw" of the general mortgages, and it would be impossible thereafter to give first liens by way of chattel mortgages on such equipment.⁶

Under the conditional sales contract, the seller of the equipment

⁶ It has become a custom of the railroads to finance equipment through the use of equipment trusts wherever sales of the obligations are to be made to the public and through the use of conditional sale contracts where there is a single lender or a limited number of lenders. In either case, the instrument is generally recorded in the states in which the equipment will normally be operated, and the equipment is marked as the property of the lender. The holders of equipment trust and conditional sales obligations of railroads have additional protection under section 77j of the Bankruptcy Act, whereby in railroad reorganizations the holder of title to the equipment may secure possession of the property. It would be greatly to the interest of prospective lenders on airline equipment if Chapter X of the Bankruptcy Act (and perhaps other chapters) were amended in such a way as to give similar protection to the holders of security titles to aircraft and spare parts and with the extension of the provision to chattel mortgages.

retains title to it as a security instrument until the entire price is paid, but the purchaser obtains possession as soon as delivery can be made. The chief difference between this method and the equipment trust system is that in the latter a trustee holds title until payment is completed, making it a three-party arrangement. The conditional sales contract is therefore simpler, provided the seller has the financial ability to carry the purchaser and the purchaser's credit is good enough to warrant such an arrangement.

Considerable progress has been made toward facilitating a wider use of equipment trusts as instruments in airline financing. In 1948 a convention known as "International Recognition of Rights in Aircraft" was adopted by the International Civil Aviation Organization. The value of this agreement, however, has been limited to those countries approving this convention. Definite limitations may be found in the lack of protection present in any seizure of registered aircraft in countries not signatory to this convention. It is probable that under the leadership of the major air powers, however, this compact may be broadened to include most, if not all, of the countries along the international air routes. The importance of this accomplishment is highlighted by the fact that for many years international lawyers have failed to reconcile conflicting national law on the subject. The basic difficulty has been that many nations with legal systems based on Roman law do not have anything like the English concept of the chattel mortgage. This has been a major obstacle to banks and aircraft manufacturers seeking a form of security for loans to aircraft purchasers which would rank as high as a first mortgage, no matter where the location of the equipment. In many countries, under existing statutes, tax liens and attachments arising from the indebtedness of an operator for supplies and other kinds of claims may take priority over a mortgage.

The convention, however, will fulfill the following objectives for those countries adopting it:

1. Afford international air operators the largest possible measure of assistance, in order to enable them to arrange financing for the purchase of aircraft.
2. Provide the best possible security for those financing the purchase of aircraft and spare parts, and others having rights therein, regardless of whether the assets concerned are inside or outside the country where the aircraft is registered.

3. Secure the rights of third parties in all countries concerned.
4. Involve a minimum of interference with national law and a minimum of trouble and expense for contracting countries.

A characteristic of all airlines is their limited financial resources in comparison with their operating and equipment needs. It will probably no longer be necessary to use earnings for the total amounts needed to purchase new equipment; but other needs will have to be met in this way, through the sale of additional common or preferred stock or debenture bonds or through bank and other loans.

Control over Airline Securities

The Civil Aeronautics Act does not provide for control over airline security issues by the Board, with the result that this body is nothing more than an interested, but largely ineffectual, bystander in airline financing. There are some who maintain that Board control over airline securities is both unnecessary and undesirable. Many of this group feel, for example, that special emphasis must be placed on having the market for airline securities free from direct intervention by the Civil Aeronautics Board because of the peculiar position which that body occupies through its control of mail pay and subsidy payments. When a railroad security is offered for sale, after its issuance has been approved by the Interstate Commerce Commission, the investor is simply assured that the proceeds will be used for legitimate purposes, that the Commission has no objection to the form of the financing as a general principle, and that the terms of sale are reasonably favorable to the railway. There is no guarantee or implication that the Commission will see to the payment of interest or dividends on the new security, because it is well known that the Commission is in no position to make good any such undertaking. It can permit rate increases, but in most cases only for the railways as a group because of the lack of noncompetitive traffic. Also, it is known that, under some circumstances at least, higher rates may produce no greater net income.

Those maintaining that airline securities should be free from Board control point out that the Board, on the other hand, has the power and often the obligation to transform an individual airline's deficit into net income by increasing its subsidy under the "need" provision of the Civil Aeronautics Act of 1938. Unlike a general rate increase, which may drive traffic to competitors in other forms of transportation, a revision in mail rates or subsidy payments simply

adds the equivalent amount of net income. Since the Board is in a position to bolster any security with earning power in this manner, approval of a new issue might be interpreted freely by investors as a rather definite assurance of safety.

It is maintained, therefore, that it is undesirable for the Board to incur even an implied responsibility for any new security issues which would in any way restrict its freedom of action in carrying out its regulatory functions. The way to avoid this and yet to give the Board a voice in the market for airline securities is to encourage free expressions of opinion about the general financial practices of the airlines. From time to time, the Board could speak for or against any particular trend in financing without passing upon specific applications. Such expressions of the Board's point of view, it is felt, would be given appropriate weight along with the opinions of airline management and their financial advisors.⁷

The Board, however, is unanimous in believing authority over airline securities to be necessary, particularly since the industry, in the last analysis, relies on the government to save it from bankruptcy. There is, of course, no implication that, should the Board have authority over airline financing, there will then be an absolute guarantee that airline financial structures will be sound or that capital will be attracted on reasonable terms.⁸ Private capital is far more concerned with the rate and route policies being pursued by the Board, since these exert a vital effect on the destinies of the individual carriers. This emphasizes the necessity of adopting a broad perspective toward the regulatory processes of the industry. Without a constructive and consistent approach toward rate making and route awards, no mere assumption of control over capital structures by the Board will provide any cure for the carrier's ailments.

The natural tendency of all industry—and the airlines are no exception—is to resist all extensions of government controls and what might be considered undue interference with private enterprise, except to the extent that control may help their activities, as is the case, for example, with the regulation of competition. The fact remains, however, that the carriers are endowed with a public interest and enjoy a franchise which provides them with a degree of monopoly and affords a certain amount of protection against competition. Moreover, financial assistance is afforded certain parts of the industry

⁷ See Roger F. Murray, "Regulation of Airline Securities," *Harvard Business Review*, May, 1950. See also *Aviation Study*, Senate Doc. No. 163, 83d Cong., 2d sess. (Washington, D.C., 1955), p. 57.

⁸ See O'Connell, Jr., *op. cit.*

through subsidy payments and indirectly through the flying aids sponsored by the government.⁹

The airlines will have continuing need for large new capital requirements. It is important, therefore, to avoid the mistakes which occurred in the earlier stages of technological development of other public utility enterprises. Giving the Board control over airline capital structures will not in itself solve all the industry's problems and assure it of sustained earnings. It will, however, coordinate the regulatory processes, center them in the one government agency expected to be best qualified to deal with such matters, and make a substantial contribution toward a sounder and better air transportation industry.

*Financial Security of Air Transportation Compared with Other Regulated Industries*¹⁰

The progress of any private enterprise depends upon its ability to operate with reasonable assurance of profit and, as in other industries, the financial security of the air transport industry is based largely upon the nature of its profit pattern and the stability of the demand for its services or product. From both points of view, the financial security of air transportation is weak in comparison with other regulated industries.

The profit pattern of an industry can best be viewed in terms of its

⁹ The need for security controls has been clearly established and accepted in other regulated industries. Under the Transportation Act of 1920 (sec. 20A), the Interstate Commerce Commission is required to approve the kind and amount of securities to be issued by railroads, as well as the price at which these securities are to be offered for sale. This power was given the Commission to protect the general public by preventing unwarranted additions to railway capitalization, to protect the investors in railroad stocks and bonds against unwise financial practices, and to protect the railroads against paying more than they should for the capital they needed. The ICC experiences with railroad financing comprise a rich background which may find constructive application in the case of the airlines. To make control over the issuance of securities effective, the ICC found it necessary to pass on the underwriting provisions and other details concerning the offering of these securities. There exist wide variations in practices which can materially affect the net proceeds obtained by an issuing corporation in underwriting of securities. For this reason, unless properly defined, the terms of underwriting agreements can preclude adequate control over the issuance of new securities.

A number of railroad receiverships, some observers believe, might have been avoided if the carriers had not developed top-heavy capital structures. Burdened with an abnormal amount of funded debt, many of the railroads were unable to service their interest requirements when their earnings evaporated with the decline in traffic and revenues. It was not until 1920, when most of the railroad financing had already been accomplished, that the ICC was empowered to act on new security issues.

See John H. Frederick, *Federal Regulation of Railway Securities under the Transportation Act of 1920* (Philadelphia: Westbrook Publishing Co., 1927); Selig Altschul, "Security Reins to CAB?" *Air Transport*, December, 1947.

¹⁰ This section is adapted from Civil Aeronautics Board, "Comments on CAA Staff Study on Airways User Charges," November 25, 1953.

profit margin (the per cent of profit to gross revenues), the return on investment (the per cent of profit to total invested capital), and the number of times per year the invested capital is turned over (the ratio of gross revenue to invested capital). While the per cent of profit to investment is probably the best measurement of the profit actually earned by a company in any given year or period, the profit margin is a more reliable indicator of the inherent risk from the recurrent economic fluctuations common to air transportation. It follows that an industry which is subject to serious and sudden fluctuations in earning power and which also has a thin profit margin will be classified in the financial market as a speculative industry rather than one of stabilized earning power.

Table 37 summarizes the key elements of the profit pattern for the six most important regulated industries, including air carriers. This

TABLE 37
REGULATED INDUSTRY GROUPS—NET PROFIT PER CENT OF
GROSS REVENUES AND PER CENT OF INVESTMENT
(Before Interest but after Income Tax for Selected Periods)

	1952	1950-52	1948-52	1946-52
PROFIT MARGIN ON GROSS REVENUES*				
Electric Utilities.....	19.22%	18.94%	18.92%	19.27%
Natural Gas.....	15.01	16.13	16.38	16.57
Class I Railways.....	10.82	10.70	10.33	9.97
Motor Carriers—Passenger.....	5.96	6.28	6.48	7.83
Air Carriers†.....	6.00	6.01	4.73	3.24
Motor Carriers—Property.....	2.59	3.06	3.42	3.35
PROFIT AS PERCENTAGE OF INVESTMENT*				
Electric Utilities.....	5.92%	5.83%	5.87%	5.93%
Natural Gas.....	5.91	6.29	6.36	6.53
Class I Railways.....	4.17	4.02	3.79	3.53
Motor Carriers—Passenger.....	12.18	11.59	11.26	14.29
Air Carriers†.....	10.86	10.25	7.99	5.43
Motor Carriers—Property.....	12.05	14.36	16.33	16.06
TIMES INVESTMENT TURNED OVER PER YEAR*				
Electric Utilities.....	0.31%	0.31%	0.31%	0.31%
Natural Gas.....	0.39	0.39	0.39	0.39
Class I Railways.....	0.39	0.38	0.37	0.35
Motor Carriers—Passenger.....	2.05	1.85	1.74	1.82
Air Carriers†.....	1.81	1.70	1.69	1.67
Motor Carriers—Property.....	4.68	4.69	4.77	4.80

* Industries are arranged in order of size of profit margin.

† Total industry data are used because of difficulty in separating investment between domestic and international operations for all the periods.

Source: CAB, "Comments on CAA Staff Study on Airways User Charges," November 25, 1953.

places the air transport industry in proper perspective in relation to surface transportation as well as other regulated industries.

It will be noted that air transportation can better be compared to motor carriers than to other regulated industries in terms of all three elements of the profit pattern. There is also substantial consistency in the general shape of the profit pattern among these different industry groups. For example, the different industry groups are arranged in the order of the size of their profit margin as given in the top section of Table 37. But it will be noted that in the bottom section of the tabulation, this order corresponds closely to the descending order of the size of the capital turnover ratios. In fact, except for the minor deviation in the case of railroads, the air transport industry constitutes the only significant exception to this order of arrangement.

As a general pattern, there is a clear tendency for the profit margin to increase as capital turnover decreases and for the return on investment to increase directly with the increase in capital turnover. It follows that a sound evaluation of the earning power of an industry requires that it be compared with other industries of similar profit pattern. Hence, to consider that the earnings of the air transport industry in recent years have been especially high or excessive, because they exceed substantially the rate of return on investment earned by electric and natural gas utilities and railroads, may well lead to erroneous conclusions in view of the fact that the profit pattern of air transportation differs sharply from that of these three industries. On the other hand, Table 37 shows clearly that the air transport industry has at no time earned a rate of return on its investment comparable to that earned by the two motor carrier industries, both of which are subject to government regulation. This is true in spite of the fact that the air transport industry is closely comparable in terms of profit pattern with these two surface transport industries.

It is important, in this connection, to keep in mind that air transportation, relative to the other five industries with which it is being compared, is still in its early stages of development. Normally, a new industry in a period of rapid growth will show higher profit rates than a more matured industry whose growth and development has either slowed down or leveled off completely. The depressed condition of the railroads can be explained by their declining traffic volume in comparison with the earlier years of the periods analyzed.

But notwithstanding the unparalleled growth of the air transport industry in recent years and the fact that the motor carrier industries earlier earned higher profits than during the periods analyzed, it is

significant to note that for no one period covered have the earnings on investment in the air transport industry equaled those in either of the motor carrier industries. Over the seven-year period, the average earnings of the air transport industry are only about one-third that of the motor carrier industries and, except for the railroad industry, are the lowest for any of the six industry groups. With such a weak showing during the period of its peak growth, it must be concluded that the air transport industry is already materially handicapped in competing with other regulated industries for capital.

The fact that the air transport industry is in the highest price position of all transport industries further undermines its financial security. While the price differential between air transportation and surface transportation, in charges to the public for services rendered, has narrowed in recent years, it is still true that air transport rates are significantly higher than for any of the three surface transport industries. Moreover, air transportation has fewer characteristics of a necessity than surface transportation, and therefore cannot depend on this for protection of its earnings position in periods of curtailed purchasing power. In these circumstances, it is reasonable to conclude that air transportation will experience its greatest competitive advantage during periods of peak prosperity and will fall to its weakest competitive position during periods of adverse business conditions when mass purchasing power is at a low ebb.

This is simply another way of saying that during periods of peak prosperity, time is more valuable than money, whereas during periods of adverse business conditions, money is more valuable than time. The economic characteristics of air transportation, therefore, are such as to maximize the degree of fluctuation between peak and valley periods, whereas the economic characteristics of surface transportation are such as to minimize this range in fluctuation. It thus becomes of utmost importance to view the earning power of air transportation—including its capacity to absorb, without undermining its financial security, any substantial additional burdens of cost—in terms of its long-range rather than short-range profit position.

*Public Aid to Air Transportation*¹¹

In discussing the problems of airline financing, one must not lose sight of the fact that very few such carriers would be in operation today anywhere in the world were it not that they receive public aid

¹¹ See Richard W. Lindholm, *Public Finance of Air Transportation* (Columbus: Ohio State University, 1948) ; Committee on Interstate and Foreign Commerce, *National Trans-*

in one form or another. Such aid is usually referred to under the broad classification of "subsidy." Much confusion exists, however, in the use of the word in connection with air transportation, chiefly because the average person does not analyze what the term subsidy includes. There has been some form of government subsidization in every air transport operating country under one or more of the following forms:

1. Direct financial payments
2. Air mail payments exceeding the economic rate for the work done
3. The provision of airways and other navigational facilities
4. The provision of airport facilities
5. The provision of aircraft
6. Taxation concessions
7. The financing of aeronautical research and development

In the past, at least in some countries, government subsidies, especially "hidden" subsidies, have been granted frequently for purposes other than the direct advancement of air transport—for example, for enhancing national prestige, military training, obtaining a monopoly of certain traffic, and the like.

It is generally agreed that there is ample economic and social justification for a measure of government assistance in the early stages of the development of any transportation agency. In the early stages there is not the normal process of economic growth, in which lower costs permit lower rates and fares, which generate a greater demand leading to a further lowering of costs, and so on. Costs are high in any new agency of transportation; and this has been particularly true of air transportation, because equipment is undeveloped and rela-

portation Inquiry, Public Aid to Air Transportation (House Report No. 1612, 80th Cong., 2d sess.) (Washington, D.C., 1948); Paul T. David, *The Economics of Air Mail Transportation* (Washington, D.C.: Brookings Institution, 1934); Federal Coordinator of Transportation, *Public Aids to Transportation* (Washington, D.C., 1940); Francis A. Spencer, *Air Mail Payment and the Government* (Washington, D.C.: Brookings Institution, 1941); Board of Investigation and Research, *Public Aids to Domestic Transportation* (House Doc. No. 159, 79th Cong., 1st sess.) (Washington, D.C., 1945), pp. 4, 26-30, 428-513; Report of the Special Committee on Transportation, *National Transportation Inquiry* (House Report No. 2735, 79th Cong., 2d sess.) (Washington, D.C., 1946), pp. 387-91; Oliver J. Lissitzyn, "Public Aid to Major Foreign Airlines," *Journal of Air Law and Commerce*, Autumn, 1951 and Winter, 1952; Donald W. Nyrop, "The Question of U.S. Air Mail Subsidy," *Journal of Air Law and Commerce*, Autumn, 1951; Harvey C. Bunke, "The Fetish of Separating Subsidy from Air Mail Payments," *Journal of Air Law and Commerce*, Summer, 1953.

tively inefficient and demand for the service rendered at economic prices is limited.

As far as air transportation has been concerned, public aid has been justified and may still be justified for limited periods because of the need for the initial development of new routes and the introduction of new equipment into service for the advancement of operating speeds, etc., ahead of what is immediately practical on an economic basis.

Governments have recognized the potential benefits of civil air transportation and have also recognized that the general economic and social welfare is secured by speeding up the process of development. From that standpoint and acting on behalf of the community, they have applied public funds to this end. In various ways this assistance has lowered costs and rates, thereby increasing demand and effectively stimulating the growth process. In addition to justification as a temporary aid to development, which should be discontinued as the industry gets properly under way, there is a case for government assistance in two other connections:

1. In providing services on social or international policy grounds, for which there may be no commercial demand even in the full maturity of the industry.

2. In providing facilities and services, such as navigational, meteorological, air traffic control, and search and rescue services, which are required also for aviation generally. This is similar to the provision of roads, bridges, road lighting and traffic regulating systems for highways and marine channels, lighthouses, and other aids to shipping.

While a healthy and fully matured air transport industry may only require a minimum of assistance in the second of these connections, such a minimum would be analogous to that provided on justifiable economic and social grounds to other public utilities. It should not be regarded as abnormal or indicative of the inability of the industry eventually to be self-supporting, provided, of course, that any aid is in line with the general benefits accruing therefrom.

A transportation industry may be termed self-supporting when the assistance given justifiably as an aid to early development, as well as any excessive and misdirected assistance given from undue consideration of national economic rivalry, prestige, and strategy, has been eliminated.

Public aid to air transportation in the United States has taken the following forms:

1. Air mail payments exceeding a so-called "service" rate
2. The provision of airways and other navigational facilities
3. The provision of airport facilities
4. Taxation concessions
5. The financing of aeronautical research and development

Insofar as any of the fundamental facilities of air transportation, such as airways and airports, are supplied to users at less than a fair and economic rate for the service rendered, to that extent may such users be regarded as government supported.

It must be borne in mind, however, in attempting to assess the progress made so far toward self-support and the future prospects of attaining the desired end, that civil air transportation as a whole covers a wide range of operations varying widely in their economic characteristics and potential profitability, under the influence of a large number of factors of technical, geographical, meteorological, and economic importance, and that, at any stage of development of the industry, individual operations or groups of operations may range from the highly profitable to the highly unprofitable. The effect of technical and economic development is to shift the whole universe of operations generally up the scale of profitability, although not necessarily preserving their relative order.

It is practically impossible to state at any given time what amount of direct and indirect assistance is being given by a particular government to air transportation. This is particularly true of international air transport. For example, in the United States, American-flag international air transport may receive government support through air mail payments to be paid in an amount or at a rate fixed by the Civil Aeronautics Board. Until lately this rate has been fixed without formal differentiation between the amount which should be paid to the air carrier as just compensation for the carriage of air mail and the amount needed by the air carrier for continued operation within the limits contemplated by the Civil Aeronautics Act. It has, therefore, been exceedingly difficult, if not impossible without extended cost studies over a longer period of time than that covered by our experience to date, to say how much direct subsidy has been granted to American international air carriers. To a certain degree the same

facts apply in connection with domestic air carriers and the amount they have received for carrying the mail.¹²

National Policy on Airline Subsidies

In its report on Civil Air Policy, the Air Coordinating Committee¹³ recognized the continued need for subsidy of some existing and some possible future air transport services, but at the same time held that the federal government should, at this time, move as rapidly as possible to terminate eligibility for subsidy for any segments of the industry which are now, or can readily be made, self-sufficient. The committee stated the following "basic principles for future subsidy policy":

The national interest in promoting air transportation must take account of the parallel national interest in the adequacy and economic soundness of all forms of transportation. This principle has assumed increasing importance as air transportation itself has grown in size and competitive impact. In the long run, the public can best be assured of maximum economy and efficiency of the over-all transportation system if each form of transportation is required to compete with other forms on the basis of inherent service advantages and true economic costs.

The Committee made the following recommendations relating to airline subsidies:

(1). Airline subsidy policy must be properly related to over-all transportation objectives.

(2). In keeping with over-all transportation objectives, airline subsidy should, so far as possible, be limited to strictly temporary aid, designed to develop needed services, which could not progress at an adequate rate without federal support.

(3). It is recognized that foreign competition and other special factors will probably prolong the period during which subsidy will be required for international air transportation operations.

(4). Where the public interest requires the continued maintenance of uneconomical services, increased emphasis should be placed upon the inclusion

¹² See Senate Committee on Interstate and Foreign Commerce, *Interim Report on Separation of Air-Mail Pay from Subsidy* (81st Cong., 2d sess.), May 5, 1950 (committee print). For the fiscal year 1954, subsidy payments to United States airlines were classified as follows:

Domestic certificated trunk airlines	\$ 3,581,000
Helicopter air carriers	2,325,000
Temporarily certificated local service air carriers	23,895,000
International, overseas and territorial air carriers	50,854,000
Total	\$80,655,000

¹³ Air Coordinating Committee, *Civil Air Policy* (Washington, D.C., 1954).

of such operations within route systems that are capable of absorbing their cost without subsidy.

(5). When any carrier or group of carriers achieves the basic capability for sustained self-sufficiency, it should be removed from the protection of subsidy eligibility.

(6). The existence of a route certificate should not in itself obligate the government to continue subsidizing a service, if it is determined that the cost has become disproportionate to the public benefits.

(7). In the future, the government's maximum commitment for subsidizing any new or renewed route should be limited, both as to amount and duration, at the time the route authorization is granted. If it becomes impossible for a carrier, within its authorized subsidy, to provide the service for which it was certificated, it would then be necessary for such carrier to seek reconsideration of its route certificate.

(8). Legislation should provide a basis for the more effective control by the President and Congress of the aggregate level of subsidy, while at the same time assuring individual carriers of reasonable stability of subsidy eligibility.

(9). Schedules should immediately be established for the orderly reduction, and withdrawal where appropriate, of domestic air carrier subsidy support.

Chapter

13 * AIRLINE ORGANIZATION

AIRLINES have grown so rapidly that it is difficult to say that any one organization is typical or that the organization of one company at any particular time is the one in effect even a few months later. However, all airlines do have certain organizational traits in common. Each carries on the major management functions of:

1. Deciding on route structures, equipment, and schedules.
2. Conducting flight operations.
3. Maintaining and servicing aircraft.
4. Servicing passengers and shippers.
5. Advertising, sales promotion, and public relations.
6. Dealing with governmental and other public bodies.
7. Purchasing and inventory control.
8. Financial planning.
9. Industrial relations.

Organization, or lack of it, has often been blamed for the deficiencies of airline management, although personal administration of assigned responsibilities, rather than faults of organization, may more often be responsible.¹ The role of organization is, however, most important in all airline functions and should be considered of prime importance for proper airline management. The vigorous growth of airlines in the past has caused constant changes in basic organizational policies, and the future will probably require the solution of even greater organizational problems. Moreover, the organizational problems of airlines are unique and more complex than those of industries, outside of transportation and other public utilities, because of the twenty-four-hours-a-day, seven-days-a-week work schedule and the widely dispersed nature of their operations.

¹ See R. Dixon Speas, "Organizing for Airline Efficiency," *Air Transport*, June, 1944.

Principles of Organization

The chief purpose of airline organizational structure, as of all other businesses, is that of establishing efficient lines of responsibility and authority. These so-called lines must be designed in such a manner as to:

1. Fix responsibility for each activity important to the success of the airline. The purpose of this principle would seem obvious, yet it has often been violated. Airline organizations have sometimes been regarded as complete even though certain functions essential to the accomplishment of their objectives have been overlooked in creating the organization plan. Not only must the major functions be assigned to large elements of the company, but it is equally important that smaller component functions be allocated to subsidiary organization elements.

2. Clearly define responsibility, authority, and accountability for all activities. In order to accomplish functions in the most economical manner, it is essential that each organization element understand clearly the exact nature of its responsibilities and authorities. The result of general and vague assignments of functions is to create confusion about the precise responsibilities of the organizational elements concerned and about the extent of their authority. Certainly an organizational element cannot be held responsible for accomplishing a job when it has not been told exactly what result it is expected to achieve. To assure full performance, responsibilities must be clearly and concisely stated in terms of the specific accomplishments expected.

3. Group together those activities which have a common purpose or which require close co-ordination. No major function should be assigned to more than one independent element of an organization. Overlapping responsibility results in nothing but confusion and delay. Specific responsibilities must be assigned to each organizational element in such a manner that the same responsibility is not performed by more than one part of the company.

4. Recognize the distinction between system-wide activities and those which lend themselves to geographic decentralization. For example, flight operations should be centrally controlled, while many elements of station operation can be decentralized, thus giving management in the field the freedom to concentrate on those things where greater knowledge of local needs can achieve better service and lower costs. Conversely, such a method frees those in the field of the frustra-

tion that must result from trying to carry the responsibility for activities to which, realistically, they cannot make significant contributions. However, because of the interrelationship between all functions of an airline, it is not possible to eliminate all problems of co-ordination. The role of the superintendent of flight dispatch, who links flight with ground operations on most airlines and thus belongs wholly to neither, is an example. These fuzzy areas should, however, be reduced to a minimum.

5. Create lines of administrative authority which are definite and clearly understood. Each employee from the top to the bottom must know to whom he reports, and who reports to him. There should be no divided authority. No member of the organization should report to more than one supervisor, or he may violate the instructions of one in his effort to follow the instructions of the other. Of course, an individual may talk with others in higher echelons and obtain their advice and guidance, but his line of direct administrative responsibility should stem from only one supervisor.

6. Maintain a distinction between line and staff, or between functional responsibility and authority. The line organization should be responsible for making decisions. It has the responsibility for seeing that all assigned work is performed in accordance with established methods, procedures, and standards. It determines the need, time, and place for action. It has the authority of command and direct administrative control. The staff or functional organization should be responsible for developing plans, obtaining information, rendering advice, and performing follow-up to see whether work has been carried out in accordance with line decisions.

7. Limit the number of subordinates that any one individual is required to supervise. There is a definite limit to the number of persons one individual can supervise effectively, although there is no fixed formula to determine the number of subordinates that should report to any one supervisor, since circumstances and the factors involved vary so much. The greater the similarity of duties among subordinates, the larger will be the number of persons whom one supervisor can co-ordinate and direct effectively. The character of the duties has a bearing, for when duties of subordinates are of a routine nature, such as handling airline reservations, for example, the demands upon the time of a supervisor are fewer. Also, the level of management should be considered, because more time for planning and less time for details should be spent at higher levels of management.

8. Provide a framework for the development of personnel. The

best way to develop and test managers, for example, is to create a plan of organization which as nearly as possible "puts them in business for themselves"; which creates on a small scale a duplicate of the total organization; which enables each member of management to see readily how his function relates to the total; and which gives local management substantial authority to make decisions. In this manner, local management provides a training ground for regional management, and regional management for top management.

Organizational Characteristics and Conditions

In deciding on one or another plan of organization for an airline, consideration must be given to a number of the inherent characteristics of the industry and the conditions under which the organization must operate. All these have been discussed in detail in previous chapters.

1. *Interdependence of activities.* One of the unique characteristics of the airline business is that, to a greater extent than almost any other business, most activities are interdependent. Nearly everything from reservations through aircraft servicing and maintenance are so interrelated that when something takes place in one activity, it affects all the others. This places a high premium on the grouping together of activities which have common end purposes, such as serving passengers and servicing aircraft. It also makes it important to provide for the close co-ordination of related activities.

2. *System-wide vs. geographic activities.* Certain airline activities can best be directed by regional and local management, while others do not lend themselves to decentralization and can best be planned, administered, and controlled centrally. For example, most of the service functions such as reservations, ticketing, maintenance, and other aircraft service activities can be most efficiently managed by a field executive who has an intimate knowledge of local needs and is in a position to make on-the-spot decisions. This is a broad area of action where local management will be more realistic, economical, and adaptable than direction from headquarters or the general office. For obvious reasons, however, the over-all policies and procedures for this work must be established centrally. On the other hand, certain activities such as schedule planning, conduct of flight operations, and the like, can best be planned, administered, and controlled centrally. In fact, local interests must sometimes be disregarded in making decisions which are for the over-all good, but local opinion should of

course be sought and local conditions given consideration in planning.

3. *Need for flexibility.* The airline industry must be operated with an extreme amount of flexibility to provide for the change and uncertainty that is an inherent condition and to make proper provision for it.

4. *Rapid obsolescence and technological change.* There is a very rapid obsolescence and high degree of technological change in the airline industry. This means that top management must be free to concentrate their attention on the development of better equipment and methods and in planning for the future.

5. *Nature of costs.* Airline organization is affected by the economics of air transportation. Compared with many other industries this is a low-profit-margin, high-risk business, with a higher proportion of payroll costs and a very large number of independent profit centers as represented by each airline's stations. The only way that costs can be effectively controlled is to give those in charge of these profit centers (stations) the responsibility and authority to make decisions involving costs and to hold them accountable for results.

Departmental Organization

As has already been mentioned, there is no typical airline organization, but certain functions of management are always provided for. Usually these are divided into the following departments:

OPERATIONS

Most airlines place a vice-president in charge of this department and make him responsible for the activities of four subdivisions, each responsible for its own part in accomplishing two things: (a) the successful completion of each schedule and (b) the constant improvement of technique, with the aim of achieving more dependable operation.

Flight Operations Division. Headed by a director of flight operations, this division is usually responsible for all matters affecting the piloting, dispatching, and controlling in flights of airline aircraft. It is also responsible for establishing and maintaining liaison with the Civil Aeronautics Administration concerning all matters pertaining to the flight operation of aircraft, pilot and dispatcher certificates and qualifications, and the keeping of necessary records relative thereto. The director of flight operations is generally assisted by a chief pilot and chief flight dispatcher.

The chief pilot on most airlines has direct supervision over all captains and first officers, so as to develop and maintain the highest possible standards of safety and operational efficiency. He aids in selecting pilots and is responsible for their training and proficiency checks and for maintaining complete pilot records. The chief flight dispatcher plans and controls the use of flight equipment in accordance with schedules, regulations, meteorological conditions, and airport facilities.

Ground Operations Division. Headed by a director of ground operations, this division is usually responsible for the administration of stations, the servicing and maintenance of aircraft away from the base station, and the operation of ground communications equipment, such as the teletype and telephone systems. The director of ground operations also maintains liaison with the Civil Aeronautics Administration concerning all matters pertaining to air carrier facility inspections and air carrier communication coverage.

Maintenance and Engineering Division. This division is usually headed by a director of maintenance, who is responsible for maintaining flight and ground equipment in a safe and operational condition, for co-ordinating the activities within this division, and for maintaining liaison with the Civil Aeronautics Administration concerning all matters pertaining to maintenance and engineering problems. The director of this division is assisted on most airlines by the following persons:

1. Superintendent of maintenance, who is responsible for the overhaul, line service, and inspection of aircraft.
2. Superintendent of communications, who is responsible for supervising construction, installation, and maintenance of all air and ground radio, telephone, teletype, telephone and electronics equipment.
3. Chief engineer, who is responsible for supervising all engineering activities related to flight equipment, aircraft ground equipment, and operations ground equipment, including engineering and research related to new flight equipment and components.
4. Superintendent of stores, who is responsible for supervising the storage, classification, and issuance of company materials and supplies.
5. Superintendent of buildings and grounds, who is responsible for the maintenance of company-occupied buildings and grounds.
6. Supervisor of vehicle maintenance, who is responsible for the

inspection, overhaul, repair, cleaning, and servicing of all company-operated automotive equipment.

Airports and Facilities Division. This division is under a director who is generally responsible for providing technical assistance in the planning and designing of construction or improvements to airline facilities on airports, buildings, offices, and related facilities; and for the assembly, verification, and distribution of airport route data and other information necessary to flight operations. On most airlines he is assisted by:

1. A civil engineer responsible for preparing necessary designs, plans, and specifications for airport and airway projects as an airline may be requested for such aid.

2. An architect responsible for developing designs, plans, and specifications for the construction of hangars, shops, terminals, offices (including ticket office), and special structures, and for supervising such construction.

3. A supervisor of flight information responsible for the assembly, verification, and distribution of flight information, including flight manuals, airport and route data, aviation charts, and emergency kits.

TRAFFIC OR SALES

The principal duty of this department is to obtain business for the airline. Thus far, it has been the practice to give one vice-president responsibility for developing passenger, freight, and mail traffic. As time goes on, the airlines will certainly follow the railroad practice of dividing freight and passenger sales activities. It is also the duty of the traffic department to make rates for both passengers and freight. All its functions bring this department into close contact with the operations department, which performs the transportation service. Under a chief traffic executive, most airlines divide the work of this department as follows:

1. General traffic and sales manager, who is responsible for planning the company's sales programs and for the development of all passenger and freight sales through regional and district offices.²

² There appears to be an increasing need to co-ordinate all aspects of customer relations or service. The airline industry has now reached a point where the expansion of the business through attracting first riders and shippers is less important competitively than building the loyalty of repeat riders and shippers to a certain airline. Most of the criticisms directed against any airline relate to some aspect of the handling of passengers or

2. The traffic advisory committee, which is composed of the chief personnel of the revenue auditor and the director of ground operations. Its chief function is to co-ordinate the activities of these sections with the traffic department.

3. Manager of agency, interline, and foreign sales, who is responsible for creating an organization of commission agents or travel agents and for developing interline and foreign sales programs.

4. Passenger service manager, who is responsible for all hostess and commissary activities. On some airlines he is also responsible for passenger baggage handling, ground transportation, and the establishment of effective passenger relations.

5. Systems reservation manager, who is in charge of establishing effective reservations procedures and administering all reservations activities.

6. Manager of schedules and tariffs, who is responsible for the creation of all schedules and for co-operation with the maintenance, flight operations, and ground operations departments. He is also responsible for the making of passenger and freight tariffs and the scheduling of charter or special flights.

7. Manager of mail and freight, who is responsible for the development of freight traffic sales and for the administration and operation of the company air mail and air freight system.

8. A group of regional traffic managers, who are responsible for the administration and direction of all sales, reservations, ticketing, advertising, publicity, passenger relations, and freight activities in their respective regions.

STAFF DEPARTMENTS

Treasury. This department is usually charged with the receipt and safeguarding of the company's passenger, mail, freight, and other revenues. It is also responsible for accounting for all receipts and disbursements. Scheduled airline accounts are kept in accordance with the uniform system established by the Civil Aeronautics Board.⁸ The airlines may, however, keep additional accounts or records, provided they do not impair the integrity of the uniform accounting sys-

freight. Significantly, American Airlines, which has so often led the way in various aspects of airline development, announced, in 1954, the organization of a customer service department to pull together all aspects of customer relations.

⁸ Civil Aeronautics Act, sec. 407; Civil Aeronautics Board, Economic Regulations, Part 202. The accounts are listed in Civil Aeronautics Board, *Uniform System of Accounts for Air Carriers*, as amended. This manual was originally published in 1947.

tem or impose an undue financial burden upon the individual carriers.

Industrial Relations. This department is responsible for procuring personnel, for labor relations, for wage and salary administration, for employee services, and for administering training programs. The director of personnel and training is assisted by the following in most airline organizations:

1. Director of industrial relations, who is usually responsible for the supervision and operation of all divisions of the department and for the company's relations with regard to labor, labor unions, and government labor laws.

2. Employment manager, who is usually responsible for the actual employment of personnel, including recruitment, interviewing, testing, selection, placement, and procedural steps relating to inter-departmental transfer of personnel in co-ordination with department, division, and section managers.

3. Supervisor of personnel records and services, who is usually in charge of the creation and maintenance of filing and record systems on current and terminated employees and the handling of promotion of company insurance programs, employee retirement plans, and other benefits to employees.

4. Health service, which is in charge of first aid to injured employees, maintenance of sanitary standards in the company commissary and elsewhere, and employee health education. Some airlines expand this activity into a regular medical program, with a physician in charge.

5. Superintendent of training, who is responsible in most organizations for the operation of the training division, covering all apprentice training programs, Civil Aeronautics Administration practical examinations, training courses for operations and traffic departments, and the like.

Public Relations. This department has the responsibility to act in an advisory capacity to management in determining company policy; to interpret and maintain an understanding of such policy among the general public, governmental officers and bodies, and company employees; and to operate the publicity and advertising departments, as well as to represent the company in directing the activities of outside advertising and publicity agencies employed by the company.

Legal. Much of the responsibility for dealing with governmental

and other public bodies is frequently placed in this department, the head of which is generally called General Counsel. In most airlines the department is charged with the following:

1. The handling of all legal corporate matters involving compliance with local, state, federal, and foreign laws wherever the company may operate.

2. The drafting of contracts required by officers and departments of the company.

3. The advising of officers and directors concerning the interpretation of laws, regulations, and contracts, and the company's rights and obligations thereunder.

4. Supervision and counsel with the company's local attorneys regarding claims and actions for or against the company.

5. The conduct of investigations and hearings, when required, under labor contracts and the rendering of decisions in connection therewith.

6. The rendering of advice and assistance in drafting instruments or documents for presentation to the Civil Aeronautics Board in connection with route cases and other matters within the jurisdiction of the Board.

7. The filing of contracts and agreements with the Civil Aeronautics Board as required by Section 412 of the Civil Aeronautics Act. In this connection, most airlines require all contracts and agreements entered into by all departments of the company to be transmitted to the legal department. The legal department then determines whether the agreement or contract comes within the intent of the Act. In the event it does, the legal department will make the necessary arrangements for such filing and will then transmit the agreement or contract to the office of the secretary-treasurer of the company for filing. In the event the agreement or contract does not require filing under the Act, the legal department transmits it directly to the office of the secretary-treasurer of the company.

Economic Research. The specific duties of this department usually include:

1. Conducting continuing industrial studies and research applicable to new route, mail rate, and other company proceedings before the Civil Aeronautics Board; preparing exhibits for these; and cooperating and conferring with the traffic, operations, and treasury departments in so doing.

2. Conferring and co-operating with all departments of the company in order to keep advised of their statistical and research needs, determining the usefulness and effectiveness of studies conducted on a continuing basis, and suggesting ways and means by which the department can assist other departments in increasing efficiency, economy, and control in their operations.

3. Conducting research and preparing statistics for use in traffic development and for publicity, advertising, and public relations work, including speeches, special articles, reports to stockholders, etc.

4. Maintaining effective liaison with the treasury and engineering departments to assure full and effective use of material and information available for statistical and research work, and co-ordinating research work with those departments and other departments of the company to assure a maximum of efficiency and economy.

Purchasing and Stores. Every airline has a department in charge of purchasing supplies and materials. Some practice the policy of having most supplies and materials delivered directly to the departments for which they are intended or even directly to the divisions where they are to be used; others maintain general stores from which supplies are distributed as needed. (When sent out over the line, they are sent as "company material.")

Chapter

14 * AIRLINE PASSENGER TRAFFIC DEVELOP- MENT

IN AIR transportation the technicians have done a much better job, relatively speaking, in their fields than have those responsible for traffic development. Airline executives have shown a much better understanding of how to operate their companies than of how the service they created—air transportation—should be sold. This was perhaps a natural condition in an industry where the first task had been to develop a service in which the public would have confidence, in an industry confronted at first with selling something absolutely new, and in an industry which had to perfect its service very largely out of capital and not out of earnings. For hundreds of years, people had been thinking in terms of land and water transportation, the accepted means of travel. At the start, therefore, the air transportation industry was faced with the barriers of old established travel habits. It still is faced with the problem of overcoming these same habits to a very large degree. Moreover, the air transportation industry found it necessary to perfect a service far beyond what the consumer demand warranted at the time. Probably no other service or product ever presented to the public had to be so perfect, so safe, and so reliable as did the type of transportation offered by the airlines before public acceptance could be expected.

The managers of airlines in the earlier days, and to a great degree today, devoted their time chiefly to building an organization for the purpose of manufacturing air transportation. These men made little attempt to sell this transportation in terms of what it would do for the person who used it. No particular effort was made to induce people to think in terms of how air transportation might affect them in their personal and business affairs. Yet if air transportation is to be sold, people must think that way. No matter how fine the equipment of the

airlines, no matter how well they may be operated, the most important part of air transportation is the use people make of it. Reduced to the barest elements, all any agency of transportation does is bridge time and distance for travelers, mail, and freight. Air transportation does it faster than any other means. In exact ratio, as people think in terms of what air transportation makes possible, the use of the airlines will be multiplied far beyond any present conception.

From a traffic development standpoint, no one envisages a saturation point for air transportation. As people think in terms of air travel, they will continually find newer and different uses for it and more ways to benefit from it. When automobiles were invented, they did not simply move people out of horse-drawn buggies and take that same number of people on the same trips they would have taken in buggies. Automobiles greatly expanded, multiplied, and diversified travel because they made possible the use of transportation in many more and different ways. More ways for people to use air transportation advantageously is the ultimate measure of the market for the product of the airlines.

Measuring Passenger Traffic

The development of airline passenger traffic may be measured in several ways:

1. By the number of passenger seat-miles flown in succeeding years, as is shown in Table 38. This figure is often referred to as "available seat-miles" and means the miles flown per each interstation trip for the carriage of passengers (as distinguished from the rated passenger-carrying capacity of a particular aircraft). Seat-miles are usually associated with what is termed "load factor" or the ratio, expressed as a percentage, of passenger-miles to available seat-miles. The number of available seat-miles on a flight, therefore, represents the passenger-mile capacity of the flight, and the load factor represents the degree to which that capacity is utilized. (See Figs. 29 and 30.) In other words, load factor measures the extent to which the service produced by the airlines is being consumed.¹ A relatively high revenue-passenger load factor usually means relatively high revenue per dollar of operating costs, since such costs, in total, are not much affected by the degree to which a particular flight's passenger-carrying capacity is used. Experience seems to indicate, however, that

¹ See William L. Grossman, *Air Passenger Traffic* (Brooklyn: Chemical Publishing Co., 1947), chap. i. See also Chapter 5.

the best load factor from the standpoint of airline operations is not far from 70 per cent, varying with circumstances for individual operators.

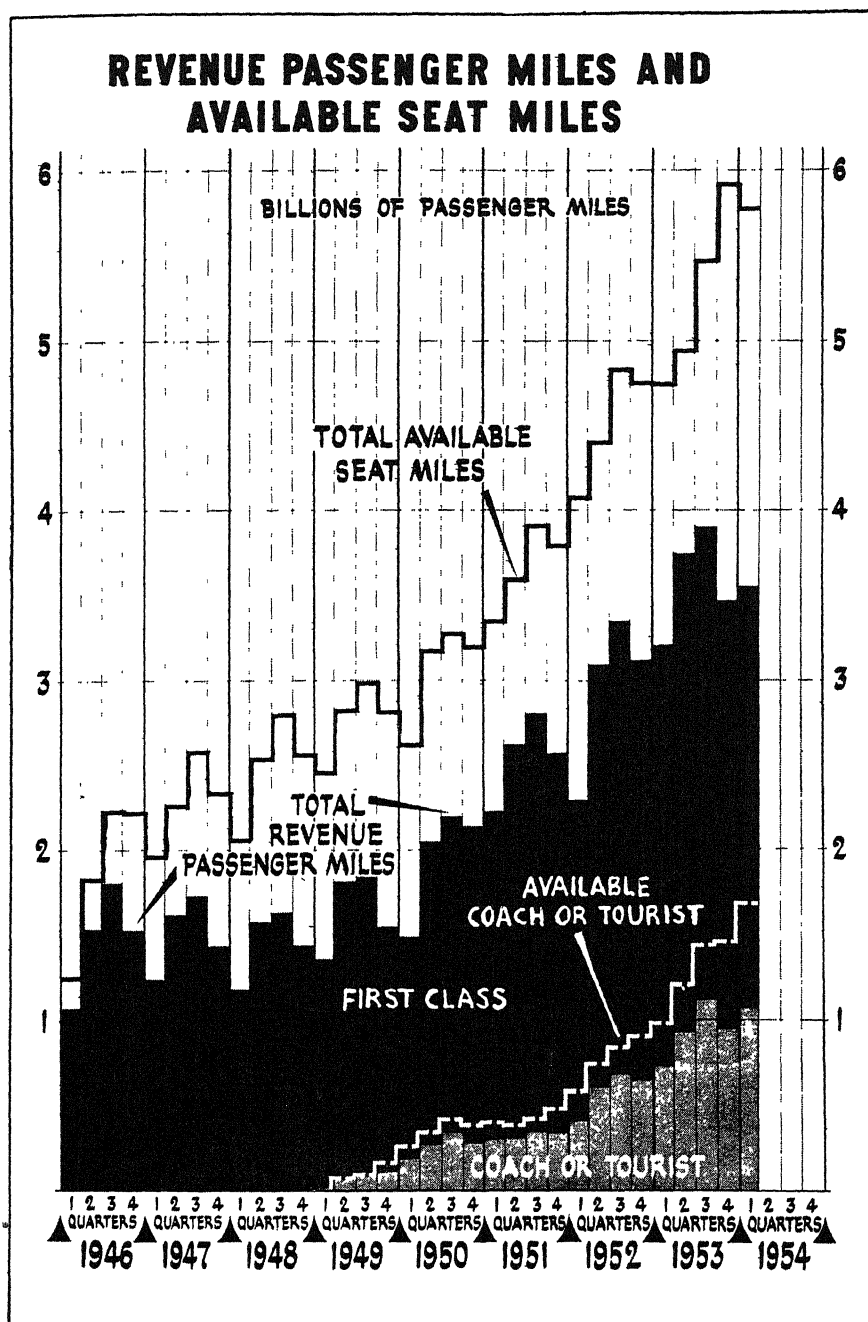
TABLE 38
PASSENGER SEAT-MILES FLOWN, PASSENGER LOAD FACTOR, AND
PASSENGER FARE PER MILE, 1926-54
(Scheduled Trunk Airlines)

YEAR	DOMESTIC				INTERNATIONAL		
	Passenger Seat-Miles Flown (000 Omitted)	Passenger Load Factor (%)		Average Passenger Revenue per Passenger- Mile	Passenger Seat-Miles (000 Omitted)	Passenger Load Factor (%)	
		Revenue	Revenue and Non- revenue			Revenue and Non- revenue	Revenue
1926	*	*	*	\$0.12	*	*	*
1927	*	*	*	0.106	*	*	*
1928	*	*	*	0.11	*	*	*
1929	*	*	*	0.12	*	*	*
1930	*	*	*	0.083	*	*	*
1931	*	*	*	0.067	*	*	*
1932	303,582	*	41.98	0.061	*	*	*
1933	373,762	*	46.77	0.061	*	*	*
1934	367,777	*	51.61	0.059	*	*	*
1935	577,651	*	54.76	0.057	*	*	*
1936	686,225	*	63.97	0.057	*	*	*
1937	836,151	49.22	57.54	0.056	*	*	*
1938	951,458	50.43	58.93	0.0518	116,100	46.34	45.83
1939	1,215,158	56.20	62.14	0.0510	134,399	58.24	53.46
1940	1,817,085	57.90	63.72	0.0507	175,454	59.56	56.88
1941	2,341,877	59.13	64.32	0.0504	248,331	66.83	65.57
1942	1,963,617	72.22	76.45	0.0528	313,109	76.75	75.68
1943	1,856,954	88.00	89.98	0.0527	307,513	82.72	79.42
1944	2,436,846	89.39	90.77	0.0535	391,293	82.32	79.37
1945	3,815,573	88.12	89.33	0.0495	583,440	79.22	76.78
1946	7,556,469	78.71	80.31	0.0463	1,553,691	72.74	70.85
1947	9,373,761	65.12	67.29	0.0506	2,924,375	63.96	61.90
1948	10,385,083	57.42	59.97	0.0576	3,292,319	59.59	57.38
1949	11,672,921	57.85	60.53	0.0576	3,625,673	59.83	56.67
1950	13,064,473	61.26	63.93	0.0555	3,695,447	63.21	59.71
1951	15,565,749	67.88	70.35	0.0560	4,327,656	63.18	60.08
1952	19,097,091	65.60	68.10	0.0555	4,850,893	65.39	62.28
1953	23,268,559	63.43	65.92	0.0545	5,472,481	65.03	61.87
1954	26,851,433	*	63.36	0.0539	6,288,491	59.56	*

* Not available.

Source: 1926-38, CAA, 1938-53, CAA, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954). 1954 estimate by CAA.

The load factor may be too high as well as too low. An extremely high load factor, such as that experienced by the domestic carriers in 1944, may be a disadvantage since it means that many would-be passengers have been refused, with consequent inconvenience to them and loss of revenue to the airlines. Moreover, as the airlines discov-



Courtesy: Air Transport Association

FIG. 29. Domestic trunk line revenue miles and available seat miles, 1946-54.

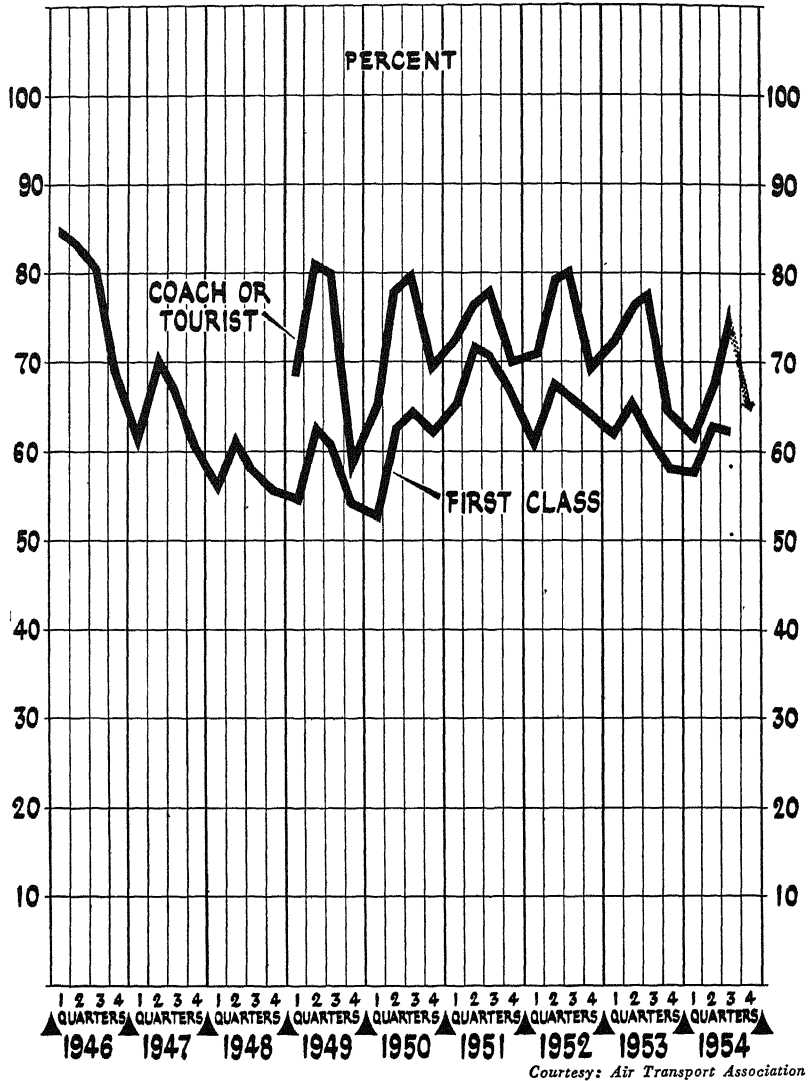


FIG. 30. Domestic trunk line passenger load factor, 1946-54.

ered during the years of very high load factors, the unavailability of space causes certain costs to increase more than in proportion to the number of passengers or passenger-miles. For example, the handling of calls from persons who desire reservations, but who must be refused, increases the reservation expense per passenger carried.²

2. By the number of passenger-miles, as shown in Table 39 and Fig. 31. A passenger-mile is the transportation of one passenger for

² *Ibid.*, p. 7.

TABLE 39
PASSENGER-MILES FLOWN BY SCHEDULED AIRLINES, 1930-54

YEAR	DOMESTIC (ADD 000)			INTERNATIONAL (ADD 000)		
	Total	Revenue*	Non-revenue*	Total	Revenue	Non-revenue
1930.....	85,125	†	†	18,622	†	†
1931..	106,952	†	†	14,171	†	†
1932..	127,433	†	†	20,754	†	†
1933..	174,820	†	†	24,956	†	†
1934..	189,806	†	†	36,844	†	†
1935..	316,336	†	†	46,035	†	†
1936..	438,989	†	†	41,829	†	†
1937..	481,116	411,545	69,571	53,742	†	†
1938..	560,660	479,844	80,816	53,799	53,208	591
1939..	755,118	682,904	72,214	78,271	71,845	6,426
1940..	1,157,900	1,052,156	105,744	104,495	99,795	4,700
1941..	1,506,303	1,384,733	121,570	165,950	162,824	3,126
1942..	1,501,279	1,418,042	83,237	240,314	236,956	3,358
1943..	1,670,935	1,634,135	36,800	254,374	244,229	10,145
1944..	2,211,905	2,178,207	33,698	322,123	310,574	11,549
1945..	3,408,290	3,362,455	45,835	462,180	447,968	14,212
1946..	6,068,315	5,947,956	120,359	1,130,196	1,100,741	29,455
1947..	6,307,690	6,103,878	203,812	1,863,268	1,810,045	53,223
1948..	6,227,932	5,963,180	264,752	1,961,794	1,888,997	72,797
1949..	7,065,199	6,752,622	312,577	2,168,799	2,053,998	114,801
1950..	8,351,745	8,002,825	348,920	2,335,956	2,206,396	129,560
1951..	10,949,898	10,566,182	383,716	2,734,014	2,599,847	134,167
1952..	12,996,657	12,528,318	468,339	3,172,209	3,021,001	151,208
1953..	15,337,760	14,760,309	577,451	3,558,509	3,385,563	172,946
1954..	17,132,000	†	†	3,821,000	†	†

* Not reported separately prior to May, 1936.

† Not available.

Source: 1930-38, CAA; 1938-53, CAA, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954); 1954 estimate by CAA Press Release of Dec. 26, 1954.

one mile and is arrived at by multiplying the miles flown on each interstation flight by the number of passengers carried on that trip. Prior to 1946, the domestic airlines reported, and the statistics derived from their reports therefore showed, passenger-miles based on course-flown distances. Since January 1 of that year, the Civil Aeronautics Board has required airline reports to be based on airport-to-airport mileage, which is considered to be the shortest distance (Great Circle track) from the point at which air mail is loaded on planes at one airport to the corresponding point at the other airport. The official airport-to-airport mileages have been determined by the Civil Aeronautics Administration and are published as *Mileage Book No. 1* (domestic) and *Mileage Book No. 2* (international) by the Civil Aeronautics Board. Airport-to-airport mileages are, on the average, about 4½ per cent shorter than course-flown-mileages.³

³ *Ibid.*, p. 5.

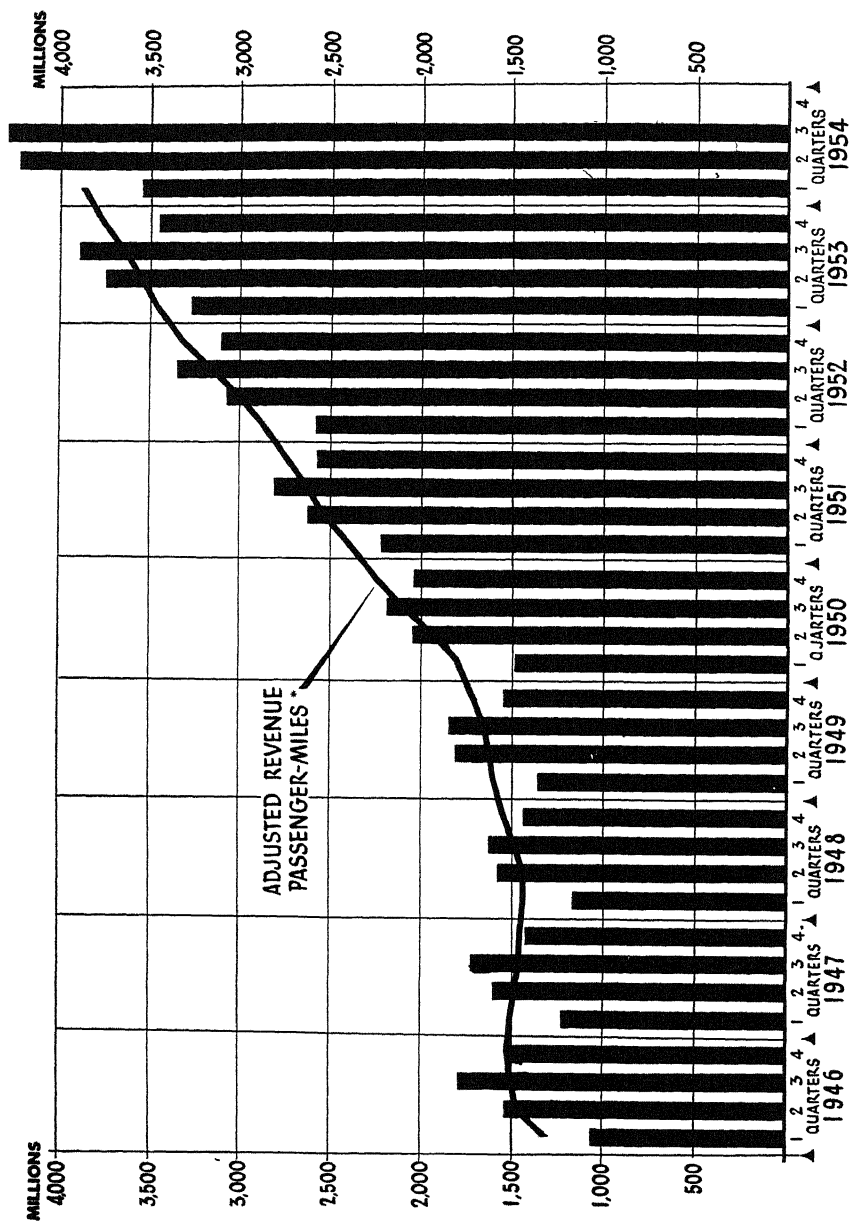


FIG. 31. Trend of revenue passenger-miles of domestic trunk lines, 1946-54. (Adjusted revenue passenger-miles based on four-quarter moving averages.)
 Courtesy: Air Transport Association

3. By the number of passengers carried, as shown in Tables 40 and 41. In the current statistical publications of both the Civil Aero-

TABLE 40

SCHEDULED AIRLINE PASSENGERS CARRIED (DUPLICATED), 1926-54

YEAR	DOMESTIC			INTERNATIONAL		
	Total	Revenue	Nonrevenue	Total	Revenue	Nonrevenue
1926...	5,782	*	*	*	*	*
1927...	8,679	*	*	*	*	*
1928...	48,312	*	*	1,401	*	*
1929...	161,933	*	*	11,472	*	*
1930...	384,506	*	*	32,999	*	*
1931...	472,438	*	*	59,224	*	*
1932...	476,041	*	*	71,519	*	*
1933...	502,218	*	*	74,394	*	*
1934...	475,461	*	*	96,804	*	*
1935...	762,820	678,549	84,271	111,296	*	*
1936...	1,042,042	931,683	110,359	87,723	*	*
1937...	1,130,338	985,084	145,254	112,324	*	*
1938...	1,365,706	1,197,100	168,606	*	109,265	*
1939...	1,895,793	1,704,762	161,031	136,090	129,028	7,062
1940...	3,038,619	2,802,781	235,838	170,179	162,617	7,562
1941...	4,141,748	3,848,882	292,866	235,802	228,524	7,278
1942...	3,559,369	3,370,398	188,971	276,200	269,345	6,855
1943...	3,484,203	3,387,967	96,236	292,888	279,402	13,486
1944...	4,761,313	4,675,164	86,149	356,662	341,496	15,166
1945...	7,605,856	7,494,140	111,716	493,498	475,558	17,940
1946...	13,705,360	13,453,110	252,250	1,066,414	1,041,283	25,131
1947...	†	†	†	†	1,359,410	†
1948...	†	†	†	†	1,372,856	†
1949...	†	†	†	†	1,520,067	†
1950...	†	†	†	†	1,675,477	†
1951...	†	†	†	†	2,041,807	†
1952...	†	†	†	†	2,365,223	†
1953...	†	†	†	†	2,700,365	†
1954...	†	†	†	†	2,820,000	†

* Not available.

† Subsequent to 1946 only the unduplicated number of passengers is reported by the domestic airlines; see Table 41.

‡ International airlines required to report only revenue passengers.

Source: 1927-37, CAA; 1938-52, CAA, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954); 1954 estimate by CAA Press Release of December 26, 1954.

navics Board and the Civil Aeronautics Administration, a person making a round trip is counted as two passengers; a person who makes a stopover becomes another passenger when he boards a plane after the stopover; a person who makes a trip over several routes by one airline is counted as one passenger; and the person who makes a trip by several airlines is counted as a separate passenger for each line. In Civil Aeronautics Board statistics for periods prior to 1942 and in Civil Aeronautics Administration statistics for periods prior to 1944, a person making a trip over several routes of one airline

TABLE 41
SCHEDULED AIRLINE PASSENGERS CARRIED
(UNDUPLICATED) 1942-54

Year	Total	Revenue	Nonrevenue
1942.....	3,225,726	3,136,755	188,971
1943.....	3,115,972	3,019,736	96,236
1944.....	4,132,114	4,045,965	86,149
1945.....	6,687,968	6,576,252	111,716
1946.....	12,465,695	12,213,445	252,250
1947.....	*	12,890,208	*
1948.....	*	13,168,095	*
1949.....	*	15,080,704	*
1950.....	*	17,343,681	*
1951.....	*	22,652,179	*
1952.....	*	25,009,815	*
1953.....	*	28,722,743	*
1954.....	*	31,853,000	*

* Beginning with 1947 only revenue passengers carried are reported by the carriers.

Source: CAA, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954); 1954 estimate by CAA Press Release of December 26, 1954.

was counted as a number of passengers, one for each of the routes. For an airline that operated several routes, the difference between an unduplicated number of passengers and the duplicated number might be great enough to mislead anyone using one figure as if it were the other. For example, in 1943, American Airlines, operating ten routes, carried 788,990 revenue passengers by an unduplicated count and 919,958 by a duplicated count.⁴

Factors Affecting Growth

The following factors have all played a part to a greater or less degree in airline passenger traffic growth:

1. The increasing safety of air transportation, as discussed in Chapter 11.
2. New routes tapping smaller communities, new stations on existing routes, and new routes serving more pairs of cities.
3. Expanded flight schedules, so that passengers can travel more nearly at their own convenience.
4. Better service, especially fewer flight cancellations.
5. Reduction of delays in arrival and departure brought about by improved air traffic control, as discussed in Chapter 2.
6. Reduction of "downtown-to-downtown" time through improving surface transportation facilities and thus, in effect, moving airports closer to the business centers of cities.

⁴ *Ibid.*, pp. 3-4.

7. The reduction in the winter slump in traffic. Seasonal decline has been reduced materially because of the education of the traveling public by the airlines on the subject of relative flying safety and smoothness of air in winter versus summer.

8. Growth in public acceptance. World War II accomplished a tremendous selling job for air transportation. Not only did it create, directly, millions of potential customers and enthusiasts among the men and women of the air forces and their families, but also it caused air travel to be introduced to thousands of persons, such as soldiers on furlough, government officials, businessmen, etc., who, had it not been for war-created emergencies, probably would not have had the occasion to make the trip at all or would have used surface transportation. Beyond these direct effects, the role of aviation in the war changed the whole psychology of the nation toward air transportation and particularly toward travel by air. It made aviation an accepted, almost commonplace, part not only of our transportation system but of our entire way of life. The war engendered among the youth of this country, especially, an enthusiasm for and familiarity with air transportation which has already been reflected in the growth of air travel.

Air Passenger Fares

During the time that the number of air travelers was increasing rapidly from year to year, the average passenger fare per mile or average passenger revenue per passenger-mile, as shown in Table 38, was gradually declining. In 1926 the average passenger fare per mile in domestic operations was 12 cents; by 1933 this had declined to slightly over 6 cents; by 1939, to slightly over 5 cents; and by 1946, to 4.6 cents, the low point so far. Since 1946, fares have been increased slightly, so that in 1954 they averaged 5 cents per mile for standard service.

Airlines must adapt their fares to meet the direct or indirect competition of various other passenger transportation agencies, particularly the railroads. The competition in fares between these two agencies must take into consideration the regularity of the service, dependability, comfort, speed, safety, accessibility, convenience of schedules, and other factors besides the price. The fares charged for each form of passenger transportation service react upon all other services and affect the volume of traffic obtainable at each particular rate.

Different conditions and practices make it difficult to generalize with respect to the comparative costs of ground and air journeys. But

it can no longer be said that air travel is a luxury to be afforded only by the wealthy, by those who are in need of speed only, and by persons who are attracted to the novelty of the service and who pay for it as they would for any other unusual and occasional entertainment.

It has been obvious for some time that air fares would have to come down if air service for passengers is to become a major transportation activity. This could be achieved either through an across-the-board fare reduction affecting every carrier in the country, or in stages by the introduction of air coach or other cut-rate devices discussed later in this chapter. The introduction of air coach fares by such an important operator as American Airlines, for example, meant that competitors had to follow. When the transcontinentals began to lower fares for a coach service, every other carrier in the country was affected. The institution of air coach by American Airlines in 1950 was, in effect, the first step in general fare reductions everywhere. Regardless of how much high-fare scheduling is retained, it seems likely that the bulk of air transport equipment will be utilized in low-fare service in due course. How fast the transition takes place is up to the Board, traffic demands, and other factors; but what began to happen in 1950 is what many in the industry expected to happen earlier. The length of time and the cost in putting postwar equipment into service, the time necessary to solve air traffic control problems at busy terminal airports, and general national inflationary trends all tended to hold off the inevitable day when the major airlines would start fighting for traffic and offering low fares.

The next few years will probably again focus attention on the weaknesses in the competitive air transport picture. It will tend to increase, instead of decrease, the problems of weaker airlines. Any development in which the fastest and latest equipment is placed into the lowest-fare market is destined to have keen significance in the economics of the industry as a whole. There will be an even sharper division between the high-unit-cost local-service airlines operating in sparse territory and the volume operators serving the big cities. There will be renewed talk about "too many airlines" and pressures for consolidations and mergers not only among the smaller but among regional carriers also (see Chapter 7).

Revenue passenger-miles should take another leap upward. The experience of air coach operators, both scheduled and nonscheduled, has given abundant evidence that a far bigger market awaits the airlines in the lower-fare brackets. Top airline managements have been fully aware of this; but time has not been ripe, costwise, equipment-wise, and operationwise, to enter this market sooner.

Penetration of Travel Markets⁵

The progress made by the airlines in obtaining a share of the total intercity passenger traffic of the country, as compared to other carriers, is shown in Tables 42 and 43. In the year 1953 the combined private and common-carrier intercity passenger market generated over 477 billions of revenue passenger-miles. Of this amount com-

TABLE 42
PASSENGER-MILES FOR VARIOUS TYPES OF INTERCITY TRANSPORTATION
BY COMMON CARRIERS AND PRIVATE AUTOMOBILE, 1946-53
(Millions of Passenger Miles)

	1946	1947	1948	1949	1950	1951	1952	1953*
PULLMAN AND AIR TRAVEL								
Rail Pullman.....	19,801	12,261	11,015	9,349	9,340	10,226	9,504	7,900
Domestic Trunklines.....	5,903	6,016	5,840	6,563	7,766	10,211	12,121	14,228
Local Service Airlines.....	7	46	88	135	189	290	340	391
Pullman and Air Combined	25,711	18,323	16,943	16,047	17,295	20,727	21,965	22,519
Airline % of Combined Total.	22.99	33.08	34.99	41.74	46.00	50.66	56.73	64.92
OTHER COMMON CARRIERS								
Rail Coach.....	39,039	27,665	24,315	20,273	17,441	19,524	19,758	19,000
Intercity Motor Bus Lines.....	25,576	23,948	23,529	22,411	21,254	21,499	20,732	19,700
Total.....	64,615	51,613	47,844	42,684	38,695	41,023	40,490	38,700
Total Common Carriers.....	90,326	69,936	64,787	58,731	55,990	61,750	62,455	61,219
Per Cent Airline of Common								
Carrier.....	6.54	8.67	9.15	11.41	14.21	17.00	19.95	23.88
Private Intercity Automobile.....	253,570	272,958	287,423	316,774	337,339	379,324	390,704	416,600
Total Common and Private								
Carriers.....	343,896	342,894	352,210	375,505	393,329	441,074	453,159	477,819
Passenger Miles per Capita.....	2,432	2,392	2,412	2,528	2,619	2,919	2,959	2,986

*Estimated data

Source: Air Transport Association, Facts and Figures, 1954.

TABLE 43
EXISTING PATTERN OF PASSENGER MOVEMENT INTERCITY
COMMON CARRIERS, 1953
(Millions of Revenue Passengers)

Distance in Miles	Railroad	Motor Bus	Airline	Total
0-50.....	65.3	230.9	0.1	296.3
51-100.....	55.7	36.1	0.3	92.1
101-250.....	47.0	23.1	8.9	79.0
251-500.....	16.0	9.0	9.7	34.7
501-1000.....	5.6	3.0	5.1	13.7
1001-1500.....	0.4	1.0	3.2	4.6
Over 1500.....	0.2	0.4	1.9	2.5
Total.....	190.2	303.5	29.2	522.9

Source: Grahame H. Aldrich, "Market Analysis of Air Traffic Potential" (1954).

⁵ This section is adapted from a paper read by Grahame H. Aldrich, "Market Analysis of Air Traffic Potential," before a joint meeting of the Radio Technical Commission for Aeronautics, The Franklin Institute Laboratories for Research and Development, The Institute of the Aeronautic Sciences (Philadelphia Section), and the Institute of Radio Engineers (Philadelphia Chapter), April 22, 1954. See also D'Arcy Harvey, "Airline Passenger Traffic Pattern Within the United States," *Journal of Air Law and Commerce*, Spring, 1951.

mon carriers accounted for slightly over 61 billions. In 1946, the airline proportion of the combined Pullman and air travel was 22.99 per cent. By 1953 this had increased to 64.92 per cent. During the same period the airline proportion of total common-carrier passenger business increased from 6.54 per cent to 23.88 per cent. In 1952, total air passenger-miles exceeded Pullman passenger-miles for the first time in our history, and it seems likely that it will continue to do so.

While the airline volume marks the fifth consecutive year of substantial airline gains as opposed to a downward railroad trend and a drifting motor bus trend, analysis of trip-lengths of passengers who comprise this market points up the near-saturation of long-haul traffic achieved by the airlines and, at the same time, clearly defines other market segments which may be susceptible to future diversion by air carriers (see Table 43).

Five distinct common-carrier markets can be recognized.⁶ The first and second comprise intercity passengers whose trip-lengths range from between less than 50 miles to 250 miles. The third market takes in all passengers moving at distances between 251–500 miles. The fourth market is concerned with trip-lengths of 501–1,000 miles. The last is considered long-haul, in which trip lengths exceed 1,000 miles.

In the less-than-50-mile group, largest of all common-carrier intercity markets in terms of revenue passengers, less than 100,000 out of 296,300,000 used airline transportation in 1953. The reason is quite clear. Except for isolated and scattered cases, characterized by unusual terrain, the airlines do not even attract passengers in this market despite their speed. Airline schedules are infrequent, if there are any at all, and dependability of operation (on-time arrival and departure) is very poor. The passenger correctly measures "enroute time" as the interval between the beginning of the first automobile ride to the airport and the end of the second from the airport. The fare is relatively high and the use of air transportation is not convenient. It is easier and much quicker to use the railroad or motor

⁶ These have been developed by the Air Transport Association of America through the use of several well established traffic surveys. The principal source surveys are the *Greyhound Bus Study*, produced by Stewart & Associates in 1941; the *Passenger Traffic Study*, by the Traffic Subcommittee, Passenger Traffic Division of the Railroad Committee for the study of transportation, Association of American Railroads, released in 1946; *Highway Motor Transportation*, released in 1945 by the same group; the *Air Traffic Forecast, 1950–1980*, released in 1950 by the Port of New York Authority, Passenger Traffic Surveys of the Civil Aeronautics Board; and the Traffic Survey developed by the Market Research Corporation in connection with the Port of New York Authority air traffic forecast. Details of the latter survey have never been released for public information.

bus or the private automobile. With present equipment and schedules the airlines can do little to exploit this potential market.

In the market between 51 and 250 miles, over 171 million passengers traveled in 1953, but the airlines carried only 5 out of each 100. However, nearly half of this traffic moved between Washington-New York, and Boston-New York. On a nation-wide level, therefore, the airlines have so far attracted only three out of each hundred passengers. In this case, too, the airlines have little to sell—especially to the over 92 million whose trip-length ranges between 51 and 100 miles. Much of existing airline traffic consists of business passengers moving between 101 and 250 miles, but even their response to airline service has hardly been spontaneous, or enthusiastic. The time advantage of travel by air is highly marginal in this market, schedule reliability is deficient and, above all, the inconvenience of two automobile trips per flight is too much effort for most passengers. This market, however, must be retained as an active airline potential and may even increase with the advent of multi-engine transport helicopters. The advantages of such equipment are obvious, provided heliports are established within the same general area now occupied by railroad and motor bus terminals. This is the “standard of convenience” now acceptable to the public. A lesser standard will result in reduced acceptance of the new service. To the extent that helicopter carriers render better service than surface and airborne competitors, so also will there be a chance for genuine exploitation of this market. Better service means more frequent schedules, time-table dependability, and better safety between cities where passenger traffic is known to exist.

The group between 251 and 500 miles accounted for well over 34 million passengers in 1953. Of this number the scheduled airlines carried 9,700,000. Although airline penetration of this market has attained 28 per cent of the total, it is nevertheless significant that nearly three fourths of all intercity common-carrier passengers have not, as yet, accepted air transport services requiring travel accommodations for trip lengths between 251 and 500 miles. In part, the principal difficulty appears to be a carry-over of passenger inconvenience caused by excessive ground travel time to and from the airports. Further, the nature of airline operations at this distance range tends to emphasize the lack of time-table dependability. The traveling public, after years of excellent dependability, as exhibited by the railroads, may be said to be “justifiably spoiled.” Where flights are from fifteen to thirty or more minutes late on a scheduled run of one hour and

thirty minutes to two hours, it simply means that the business or personal plans of the passengers must often be readjusted. In the case of the business passenger, such a readjustment can be, and usually is, an item of embarrassment. There is no question concerning the ability of the scheduled air carriers to obtain more traffic within this particular market, provided the degree of schedule dependability is improved. Secondly, frequency of flights also contributes to the response of many passengers. Within certain traffic areas an increase of daily scheduled service will do its part to attract a portion of the 25 million intercity passengers who have not, as yet, elected to go by air.

It is in the group between 501 and 1,000 miles that scheduled airline transportation becomes increasingly effective. About 5,100,000 passengers of the common-carrier total, in 1953, were carried by the airlines, a penetration factor equivalent to 37 per cent. From a passenger point of view, many airline operating deficiencies become less apparent at these distances and are, therefore, a source of less irritation. This condition is brought about by passenger trip-lengths. At distances between 500 to 1,000 miles, the speed of air transport—including time allowance for ground travel to and from airports, flight delays and the like—is far superior to the best prevailing running time of surface carriers. While it is true that the plans of the business passenger will again be subject to readjustment due to a genuinely late arrival, most passengers have learned to “take an earlier flight” if there is any question about weather conditions and an earlier flight is listed in current time tables. There appears to be a need for increased schedule frequency between certain principal traffic cities in this market. This may be accomplished within the next decade, through additional equipment purchases which may allow airline penetration to increase from 37 per cent to perhaps as much as 60 per cent by 1965.

More than 1,000 miles is the “long-haul” travel market. In 1953, 7,100,000 common-carrier passengers bought in this market. The airlines carried over 5 million of this group to establish a penetration of 72 per cent. There is, however, some question as to the continuance of such a penetration factor and already there are indications that a change may come about. The first symptom of change concerns stability of passenger trip-length. For at least three decades—and notwithstanding three wars, shifts of population, decentralization of industry, and other social-economic developments which distinguish this period of American history—the proportion of common-carrier travelers moving within specified trip distances has remained rela-

tively constant. This means that channels of common-carrier passenger movements are also well established. During the past five years, in particular, much of the traffic acceleration of the scheduled airlines has been derived from within the long-haul market. Expansion of this long-haul market from its present level of slightly over 7 million to somewhere near 9 million passengers must depend upon the growth of national population and acceleration of the national economic welfare. Both of these elements exhibit a mature rate of movement, certainly much slower than the rate of gain displayed by the airlines within the past five years. Saturation of this market has been said to begin at that point where airline penetration approaches 80 to 85 per cent. Thereafter, the ability of the airlines to capture more common-carrier traffic at an annual rate, comparable to past experience, becomes impossible. The future rate of expansion will, therefore, probably resemble the slow rate of growth exhibited by population and national income.

Selling Air Travel

Analysis of literally hundreds of reasons stated by people as to why they travel reveals not more than three fundamental conclusions:⁷

1. All reasons can be assigned to either a business requirement, a personal desire, or the chance happening of a genuine emergency.
2. Rarely, during the past thirty years, has a form of common-carrier transportation, in and by itself, constituted a bona fide "reason" for travel.
3. The discovery of a "new reason" to motivate passenger travel is rare to the point of nonexistence.

Passenger decisions as to choice of conveyance are subject to a similar series of specific conclusions:

1. Business travel occurs as a combination of type of business activity plus occupation within the same activity. This combination, in nine chances out of ten, will determine the frequency and pattern of travel as well as the method of travel. In the latter selection, "value of service" (as measured by carrier schedule frequency, speed reliability, safety and convenience) is weighed against the business evaluation which will result from the trip. If it is worth taking at all, it is worth the best. The great majority of business travel, therefore,

⁷ As stated by Grahame H. Aldrich, *ibid.*

makes use of first-class travel accommodations, and moves in definite, easy-to-follow, patterns.

2. Travel which is undertaken to satisfy a personal reason is the product of individual environment, habits, and tastes, accompanied by sufficient income to translate desire or need into active want followed by decisions. The level of available personal income wholly dominates the multiple question—"if," "when," "where," and especially "how" shall this trip be taken? Such carrier features as speed, safety, frequency of schedule, dependability, convenience, and the like, are weighed against out-of-pocket expenditures for the purchase of tickets. Because individual habits and personal traits exhibit marked stability, and because levels of personal income tend to expand rather slowly, the choice of carrier to be used and the resultant patterns of significant passenger movement are highly static. Few repetitive trips are taken in the interest of experiment or curiosity. It follows that most personal transportation is relatively stable as to pattern and is characterized by trip lengths which are shorter than those of the business passenger.

3. Emergency travel occurs in variable quantities and patterns. When the emergency is purely a personal affair, or due to an unexpected business development, the choice of carrier frequently follows the respective travel habits previously established by the business passenger or by the personal passenger. Most emergency trips are, of course, nonrepetitive. They represent a purely temporary condition. When this condition is satisfied, or otherwise removed, there remains no valid reason for additional travel. On the other hand, when the emergency is national in scope, such as was the case during World War II, emergency travel becomes repetitive. Patterns of movement remain virtually constant for the duration of the emergency, but choice of carrier is apt to depend upon space availability rather than upon the price of the ticket or the caliber of carrier services.

Bearing in mind the reasons why people travel as well as the considerations affecting their choice of carrier, it will be seen that the three component parts of every sale, whether of a tangible or an intangible, apply to selling air transportation. These are: (1) finding the prospect or the person needing the service, (2) making the sale, or turning the person who needs into a person who wants, and (3) performing the service.

It is necessary for the salesman of air transportation to know what a prospect for such service is before he can know where to find such a

prospect. Although everyone is a prospect for the sale of some form of transportation, not everyone is a prospect for the sale of air transportation. Nevertheless, a prospect for air transportation may be defined broadly as "anyone who has occasion to travel to a territory served by a particular airline either by this line directly or by some means of connecting services." In accordance with this definition, airline prospects might be broadly classified as follows:

1. Those who know that airline service meets their transportation requirements. This group includes the steady users of the airlines, who recognize the advantages of such a method of travel.

2. Those who think that airline service might possibly meet their transportation requirements. This group includes many of those now using the Pullman services of the railroads. It clearly includes all those who make inquiries concerning fares, airline facilities, routes, connections, times of arrivals and departures, and many other matters concerned with the transportation service they have in mind at the moment of inquiry. They know their transportation needs and voluntarily make the attempt to discover if the airlines can supply those needs. When these prospects are sold, they automatically enter the first group and become airline customers.

3. Those who are unaware of the advantages of airline service in meeting their transportation requirements. This is the largest group of all and includes a considerable number of passengers now using the Pullman services on the railroads. These prospects either have never used air transportation or have used it very seldom. Many of them have never even given a thought to the possibility of using air transportation because of custom or habit which causes them to use rail and motor services instead. They do not know what airline fares or schedules are and make no attempt to find out. This group includes excellent prospects; they are usually out of touch with recent developments in air transportation and do not know how airline services can meet their requirements or the advantages of air travel.

4. Those who deny or refuse to admit that airline service meets their transportation requirements. For one reason or another, these travelers, either because of personal experience or because their sales resistances of fear of the unknown or ideas as to the cost of air travel have not been overcome, refuse to admit that air transportation offers any advantages to them. Sometimes their opinions are based on a misunderstanding of their own transportation requirements. These prospects offer the greatest challenge to airline salesmen.

Classifying Prospects

Even the aforementioned four groups are generally too broad for the most efficient selling of air transportation, and most airlines have found it necessary to concentrate their sales efforts on certain sources within these four groups. Arranged in the order of their importance and accessibility, in combination with the volume of business to be expected, these sources are:

1. Holders of Air Travel Card contracts discussed later in this chapter. In a sense, an organization holding such a contract has passed out of the prospect stage into the customer stage, but salesmen must maintain regular contact with the individuals in any such organization in order that the contract will be used. These prospects are most accessible, since every airline office has an up-to-date list of Air Travel Card contract holders.

2. Companies with home offices elsewhere but with branches in the territories served by a particular airline. These prospects are disclosed either by the nature of the company or by its advertising in trade papers, in classified sections of telephone books, in trade directories, and elsewhere. The nature of a company's product or service also points it out as a prospect. For example, manufacturers of oil well supplies and equipment are prospects for the service of an airline serving petroleum-producing territories.

3. Companies distributing their products or services in the territories served by a particular airline. These prospects are discovered in much the same manner as those discussed under group 2.

4. Branches of companies whose headquarters are in the territory of a particular airline. These prospects are also discovered in much the same manner as groups 2 and 3.

5. Professional men whose practice is concentrated in the areas served by a particular airline. These prospects are somewhat hard to locate but include, for example, petroleum geologists who would be interested in travel to, from, and through the petroleum-producing regions of the country, trade association executives, lawyers, congressmen and other legislators who have occasion to travel to and from the various capitals, merchandising specialists who conduct special sales campaigns for department stores, etc.

6. Individuals who have specific reasons for making particular trips. The local newspapers are fertile sources of leads to these prospects. Such a group includes delegates to conventions, representatives of construction companies and other contractors who have been

awarded contracts in areas served by a particular airline, department store buyers who must make frequent trips to and from buying centers, members of families one or more of whom may have met with accidents in areas served by a particular line, people planning to attend expositions and merchandise shows, football and baseball fans who like to follow the local teams to distant games, etc.

7. Vacationists. This group represents a large potential volume of business but is placed last in the classification of prospects because a vacationist makes one or two trips a year in contrast to ten, twenty, or thirty trips made for business reasons by members of other groups. Vacation travel can, however, be solicited along with business travel and does not require as much special sales segregation. Competition for vacation travel, however, includes not only other systems of transportation, including the private automobile, but also other airlines serving the same vacation areas as the particular airline whose services are being sold. These prospects are also less accessible than the other groups because it is difficult to acquire a source of information that will tell a salesman just when a vacation prospect is planning to take a trip. Sometimes clues may be obtained from the hobbies of prospects, as disclosed by club affiliations. For example, trapshooters are generally hunters also, and members of Isaak Walton League chapters are fishermen. Sporting goods stores are excellent sources of leads since they know their clientele, know when they are planning trips, and know those who can afford to take week-end and other special trips.

Locating the source of prospects does not constitute all there is to finding prospective airline passengers. Within the source must be located the individual prospect who does the traveling. This applies particularly to sources 1, 2, 3, and 4 discussed above. Once the individual prospect is found, the salesman must convert him into someone anxious to travel by air, and this cannot be done until something is known about him and his travel needs. The best chance of success in selling airline service is to apply the product—transportation by air—to an individual's needs.

Surrounding every prospect are key people who also are in a position to assist the salesman of air transportation. These people are the receptionists, telephone girls, and secretaries who make it easy or difficult for the prospect to be seen; yet these individuals never, or seldom, travel themselves. They should not, however, be overlooked. They should be as thoroughly sold as the man who might have occasion to travel by air. There are also those persons surrounding the

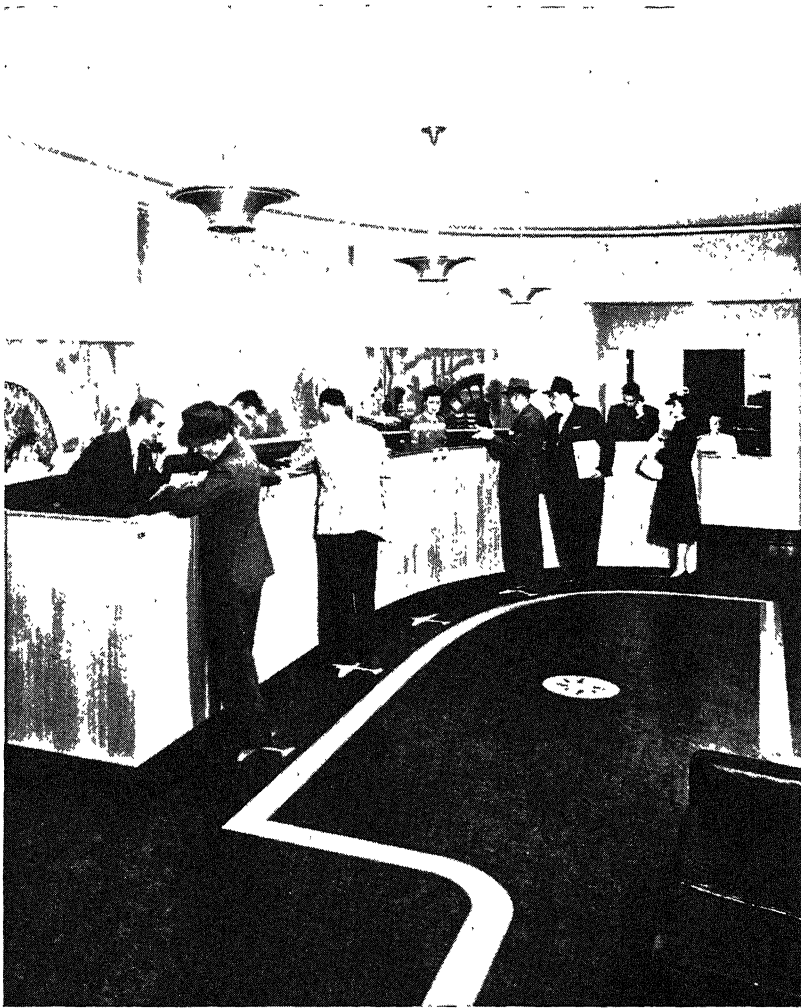
actual prospect who may not have occasion to travel themselves but who definitely control the travel and travel methods used by the prospect. For example, the head of an organization may forbid his men to travel by air. In such cases, even though the individual prospect is thoroughly sold on this mode of travel, no business results because the "big boss" has said "No."

Making the Sale

Few, if any, people are going to travel by a particular airline just because it is "American," "Braniff," "United," "Eastern," or some other. Few, if any, people are going to travel by air instead of by other means just because it is flying. Traveling by air must be sold to new prospects by applying the schedules and fares of an airline or connecting lines to their particular problems and showing them the personal advantages to be gained from the use of air transportation.

Greater earnings possibilities result from the additional time air travel makes available for other things; from the increased opportunities open because of the rapidity of travel to distant and otherwise inaccessible cities or territories, thus opening sales possibilities which otherwise would have to be foregone or be placed in the hands of less capable salesmen or negotiators; from the closer supervision and more frequent contacts with the sales organizations; from quicker action on servicing jobs, as when heavy machinery breaks down in the field and requires experts for repairing; from added energy because of less "travel fatigue" and more sleep in stationary beds; from more time for refreshing relaxations; and, last but no means least, from the actual dollar value of the working hours made available by more rapid transportation. Few businessmen bother to translate into terms of salary dollars the extra working hours made available by air travel. This is the job of the air transportation salesman. The most obvious advantage of air transportation over other means is speed, which at the same time registers a negative reaction in a lot of minds. The average person's conception of speed is still "danger." In his mind is the thought that riding at 75 or 80 miles per hour in an automobile seriously jeopardizes life and limb. So instead of talking speed, the well-trained airline salesman talks the results of speed—a saving in time—to his prospects from the standpoint of not only what air travel accomplishes for the traveler himself but what rewards are obtainable in his business and for his family.

Much air passenger traffic is noncompetitive with other carriers. A great deal of the business of the airlines is created by the speed of



Courtesy: United Air Lines

FIG. 32. A typical airline ticket office.

air transport. That is, if air transportation were not available, much of the travel on the airlines would not take place at all. For example, the businessman who makes a hurried trip from one coast to another often would not make the trip at all except for the fact that he is able to get to his destination, transact his business, and return within the space of a couple of days.⁸

⁸ A 1954 survey by United Air Lines reveals that 70 per cent of its total passengers were men and 60 per cent of its passengers were traveling on business. Another survey by American Airlines, made in the same year, discovered that 15 per cent of its travelers accounted for 54 per cent of the trips, and that while the airlines had made relatively deep penetration of the business travel market, which accounts for about 38 per cent of the total market, they had only captured 14 per cent of the pleasure travel market.

Moreover, the speed of air transportation is building business for other carriers in increasing amounts year by year. More and more, modern business and sales methods depend on close personal contact between the seller and the purchaser. The speed of air transportation makes it possible for more organizations than ever before to extend their markets throughout the country because they are able, without the expense of a large number of salesmen, to use air transportation for the purpose of keeping in touch with their customers. This creates a demand for goods that in large measure are shipped by other carriers.

Sales Resistances to Be Overcome

Air transportation has attained all the technical perfection attached to a major transportation system. Before reaching a full measure of success, however, the airlines have still to overcome certain mass resistances to this mode of travel. This is probably the greatest challenge ever offered to the selling of a service, since practically the entire job of promoting air transportation to a position of mass acceptance in this country has yet to be accomplished. In a country of approximately 150,000,000 people, only an estimated 300,000 to 400,000 people normally make extensive use of air travel. Other forms of transportation have their problems, but the airlines are confronted by certain real and definite complexes on the part of the general public. Before mass acceptance becomes a fact, these will have to be overcome.

Most important of these complexes is that of fear, which may be characterized by ignorance and fear of the unknown, which itself is based on ignorance.⁹ These are the psychological factors involved, and they work together. They do not exist as separate hazards to the progress of air transportation, and so they contribute equally to each of the following mass resistances which the salesman of air transportation has to overcome:

1. "I'll stay on the ground, thanks!" Fear for personal safety has been characterized as "the first protective wrapping around the blind prejudice of the person who prefers to stay on the ground." If this prospect for air travel can be educated so that he realizes that he is

⁹ Many traffic surveys and market analyses have been made by the individual airlines, publishers, and others who are interested in the future of air transportation. All such surveys have had practically the same percentage of answers to the question "Why don't more people fly?" In every case, 65-70 per cent of those questioned said "fear" was the prime reason. "Cost" was second in 35-40 per cent of the answers in nearly all surveys.

as safe in an airplane, particularly the commercial transport plane, as in another vehicle, he has taken the first and longest step toward becoming a steady air traveler. (See Chapter 11.)

2. "Flying costs too much." This is the second most popular misconception—that travel by air is extremely expensive. Various studies have contradicted this statement, particularly for business executives. For such travelers, air travel is more economical than any other. The argument is, however, still strong for other types of prospects even though for most trips it can be shown that, on a one-way first-class base, air travel costs no more than rail.

3. "I won't let my husband fly." One of the most serious problems still faced by air transportation is the opposition of women to their husbands or other relatives using the airlines.

It must be admitted that the increased use of air transportation by all classes of people during World War II did much to break down these resistances and particularly to make women realize that air travel is simply another means of getting about the world, speeding communications, and making it possible to get more places and do more in a given time. However, for airlines to feel they no longer have to overcome any resistances is too optimistic, because "fear" of getting off the ground will be with us for a long time.

Other, but less important, resistances which have to be overcome in individual cases might be classified as follows: uncertainty of weather, improved rail transportation, habit of using other forms of transportation, distance to airports, baggage restrictions, and the necessity of making definite reservations.

Plans for Increasing Air Travel

Up until World War II, the efforts of airlines to increase air travel were largely confined to the development of what became known as the Air Travel Card plan, which had been originated by American Airlines in 1934. Under this plan, a subscribing company or individual made a deposit of \$425 with an airline and was given one or more Air Travel Cards. On presentation of these cards at any airline ticket office, the holders received regular airline tickets, the cost of which—less 15 per cent from one-way fares—was billed to their companies or whomever had entered into the contract. In 1941 the deposit required to open an Air Travel Card account was increased to \$450, but shortly thereafter again was made \$425. Soon after the United States entered World War II, the 15-per-cent-discount feature

was removed so that since that time, accounts have been charge propositions only. In 1942 and again in 1945 the Civil Aeronautics Board undertook an investigation of this plan of selling air transportation with the idea of ascertaining whether it was or was not unduly discriminatory. The conclusion of the Board was that the plan, with certain minor adjustments, could be considered as not discriminatory.¹⁰

The advantages of the Air Travel Card plan for the airlines and the users of air transportation may be summarized as follows:

For the Airlines. 1. Sales personnel have an easy selling approach with something definite to talk about. When all sales are for cash, wide and costly solicitation effort is necessary to find a few needful individuals. Holders of Air Travel Cards become more frequent users of air transportation and are easily reached by airline salesmen since their names are known.

2. The amount of bond and insurance required to protect cash received at ticket sales points in the course of daily business is reduced, since Air Travel Card sales are charge transactions.

3. Because the charges to a relatively small percentage of the accounts exceed \$425 monthly and these accounts are generally paid promptly, the deposit system is virtually prepayment for transportation, despite the fact that the whole sum may be withdrawn without any sales.¹¹

4. In the eyes of the user of air transportation, a nationwide system of air transportation is created, owing to the ability to buy through tickets and through-trip insurance and to check baggage to destination even though several lines may be involved.

For Subscribers. 1. Time is saved in purchasing air transportation.

2. Convenience is increased in using air transportation at any time without cash.

3. A check record is made available on the individual travel habits of subscribers' personnel and their expenses.

Under the present plan, no limit is placed on the number of Air Travel Cards which may be issued to any eligible person under any contract, so as to promote wider and more extensive use of air transportation by such individuals. Because of the concentrated groups of

¹⁰ *Universal Air Travel Plan Case*, CAB Docket No. 1939 (1946).

¹¹ The Air Travel Card plan generates a considerable amount of interest-free working capital for the airlines. As of Dec. 31, 1951, air travel plan deposits with fifteen certificated airlines in the United States amounted to \$16,313,827, or 24 per cent of the total net working capital of the industry at that time.

prospective air travelers represented by the card holders, among whom solicitation is fruitful, in comparison with a widely scattered, though more numerous, group whose travel habits or needs are unknown, the airlines generally feel that the plan permits effective sales work with a substantially smaller sales force. Many reasons are given for this condition, among them that the plan makes accessible large numbers of potential users whose travel habits are known or can be ascertained; that the contract, when made, overcomes objections to air transportation of subordinate personnel; and that it therefore renders less difficult the salesman's task in promoting air travel.

As of 1955, seventy-seven of the world's scheduled certificated airlines were parties to the Universal Air Travel Plan, the only worldwide credit plan in operation. The plan is jointly sponsored by the Air Traffic Conference of the Air Transport Association and by the International Air Transport Association. Over half a million cards of three chief types are outstanding: any of which may be either territorial, international or controlled: (a) Personal air travel cards; (b) Air travel "K" cards; (c) Air travel "Q" cards. Any individual designated in writing by a subscriber may receive a Personal or "Q" card. "K" cards are issued only to employees or members of a subscriber's family.

The holders of territorial cards are restricted as to what air travel may be charged. In the United States this type card is known as a "North American Card" and entitles the holder to charge all tickets issued by participating carriers on the North American continent, Central America, the Bahamas, West Indies, Bermuda, and the Hawaiian Islands. The international cards are good on participating airlines throughout the world. Controlled cards are issued when the purchaser is a citizen of a country which has restrictions on the amount of air travel purchased during a given period of time. Of the 652,310 holders of Air Travel Cards in 1954, residents of the United States, Canada, and South America held 457,881, with this country having by far the largest number.

The Family Fare. This plan was initiated by American Airlines and subsequently adopted by most of the other airlines. It permits one member of a family paying full fare to be accompanied by additional members at half-fare on flights originating during Monday, Tuesday, or Wednesday, when traffic is usually lighter than during the remaining four days of the week.

The family fare plan seems to put substantially more traffic on aircraft during the days on which it applies, but it is hard to say how

many travelers who normally might travel on other days of the week put off their trips or move them up so as to take advantage of the plan and take wives and children along for half-fares.

Installment Purchases. Starting in 1954, Pan American World Airways introduced the plan of selling foreign travel on installments. Under such a plan a traveler may go into any ticket office of the company or to any of the 1,500 travel agencies in this country accredited by Pan American and buy a complete foreign trip including all travel, hotels, meals, etc., and arrange to pay for it in up to twenty monthly installments financed through arrangements between the airline and a personal finance organization operating offices throughout the United States. Other airlines, particularly American Airlines and Trans World Airlines instituted plans of their own to sell air travel on credit during 1954. The plans now in effect fall into two main categories: (a) one group works with the personal finance type of organization; (b) the second uses consumer credit departments of commercial banks.

Adherents of the first category maintain that the finance companies are better geared to handle this type of credit and can expedite transactions on satisfactory risks without undue complication and delay. The supporters of the commercial bank medium assert that interest cost for the consumer averages lower than through any other financing medium available.¹²

Extension of credit to finance consumer travel by air is not new, but it has been unsuccessful in the past because ease of arrangement and ready availability at point of sale were lacking. Further, national promotion was difficult because past plans were unavailable from coast-to-coast on a standard basis.

All plans require a down payment of at least 10 per cent, including the financing charges. The balance is payable in installments up to twenty months. This payment more than covers the usual commission to travel agents, where their services are involved (7½ per cent), so at the very worst, if the credit traveler defaults, the carrier will be out only the amount of its services.

The chances are that the credit volume of passenger traffic will fill up seats that otherwise might have been empty. Accordingly, the airlines can gain much in additional revenues, which may have a major impact on earnings with only a limited risk. This is true be-

¹² See Selig Altschul, "Carriers Like Pay Later Plans," *Aviation Week*, September 6, 1954.

cause, once operating costs are covered, virtually all additional revenue received flows through to net income.

*The Air Coach*¹³

The term "air coach service" has had various definitions, depending largely on who was defining it. An executive of an irregular air carrier might describe it, for example, as a new type of service originated by noncertificated carriers and designed for the poor man's purse, lacking various "frills," and contrasting with the "luxury" air service offered by the certificated airlines.¹⁴ An executive of a certificated airline might see the air coach as merely "low-cost service at the lowest rates consistent with sound business principles."¹⁵ The Civil Aeronautics Board, in 1949, defined it as

non-deluxe air transportation offered by certain of the air carriers, at a fare approximately four cents per passenger-mile, as compared with the average of about six cents per passenger-mile for regular services, with departure times from the terminals generally between ten or eleven o'clock at night and three o'clock in the morning, and eliminating the usual reservation procedures and meals featured by standard air service.¹⁶

Early in 1950, however, when transcontinental air coach service began to be offered by American Airlines and TWA, the Board modified its rules concerning departure times and reservations, so that departures could be made at more convenient hours and reservations made in advance. As time has gone on, therefore, air coach service has been hard to define exactly, except that lower fares are involved.

Air coach service was first introduced by certain noncertificated or irregular carriers flying between the chief traffic-generating centers, principally the transcontinental and New York City-Florida routes, under an exemption from the economic provisions of the Civil Aeronautics Act. This exemption had been granted by the Board under circumstances explained in Chapter 6.

Spurred on by the success of the irregulars, the certificated airlines, beginning with Capital Airlines in 1949, gradually began offering the coach-type service. By January, 1951, all the larger carriers

¹³ See Harold A. Jones and Frederick Davis, "The Air Coach Experiment and National Air Transport Policy," *Journal of Air Law and Commerce*, Autumn and Winter, 1950; Stanley Berge, "Regulation of Air Coach Service Standards," *Journal of Air Law and Commerce*, Winter, 1953.

¹⁴ See *Hearings before the Committee on Interstate and Foreign Commerce on Sen. Res. 50 (81st Cong., 1st sess.) (1949)*, pp. 260 ff.

¹⁵ *Ibid.* p. 1126.

¹⁶ CAB, *Domestic Sky-Coach Survey* (Washington, D.C., 1949).

had begun to offer the service and by 1954 coach passenger-miles accounted for 31.7 per cent of the total traffic of the certificated domestic air carriers as shown in Table 44.

TABLE 44
AIR COACH OPERATIONS OF CERTIFICATED DOMESTIC
AIR CARRIERS, 1948-54*

Year and Month	Revenue Miles	Revenue Passengers	Revenue Passenger-Miles (000)	Passenger Seat-Miles (000)	Revenue Passenger Load Factor Per Cent	Coach Passenger-Miles as Per Cent of Total
1948.	120,301	7,603	4,835	6,636	72.86	.....
1949.	7,919,563	323,838	251,288	358,363	70.12	3.7
1950.	2,431,699	1,267,381	1,056,093	1,422,641	74.23	13.2
1951.	27,684,125	1,519,849	1,272,332	1,708,115	74.19	12.5
1952.	47,721,091	2,434,382	2,345,677	3,104,877	75.55	18.7
1953.	75,950,311	3,689,257	3,731,915	5,128,925	72.76	25.3
1954.	108,961,000	5,630,000	5,321,173	7,802,978	68.19	31.7

* These figures are included as part of the domestic scheduled air carrier operating statistics in Tables 38, 39, and 41. Domestic coach service was inaugurated November 4, 1948.

Source: CAA, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954). 1954 estimate by CAA.

There is no doubt that the availability of the cheaper air coach service has promoted air travel and will continue to do so, but there is considerable risk that its expansion may have already developed uneconomic conditions. These have come about because (a) seating capacity has been increased, partly to equalize the effect on total revenues of the reduced fares at the very time when the industry's basic problem has been overexpansion and increased costs, (b) the prospective gain in traffic over the long run may be insufficient to allow profitable operations without serious diversion from standard service flights.

The two magic words "air coach" were supposed by some in the industry to be the open-sesame to a new day of profitable volume air travel. The air coach was to create a great mass of new traffic. But coining new words has not altered the simple fact that an air coach ticket is nothing more or less than a ticket on an airplane, and whether or not it produces a profit or loss must be measured by the identical economic processes by which profit and loss are determined with regular-fare seats. The adoption of the air coach was simply applying good salesmanship to a price reduction on the basic product. And by reducing the price of the product, the proponents of air coach service were trying to attract an entirely new group of travelers who would choose the airplane instead of the automobile, the railroad, or the bus.

Essentially the provision of air coach service involves the application of the principles of discriminatory pricing to air passenger service. It represents an attempt to exploit differences in elasticity of demand in the various parts of the potential market, lower rates being offered to those customers whose demand for the service is relatively elastic. These, in general, are the persons to whom lower fares are much more significant than high quality of service; greater speed cannot attract them to the airlines from surface carriers at the relatively high air fares, but they can be attracted at lower rates. Were the airlines to lower fares on all types of traffic in order to get these customers, they would be getting less revenue from existing passengers than they now obtain. But by holding up fares on the higher-quality service and providing low coach rates, revenues are kept at existing levels from present customers and additional revenue is obtained from the new customers.

The introduction of air coach service is profitable, of course, only if it adds more to the airlines' total revenue than it adds to their total cost. If the air coach service merely diverted passengers from the luxury service, the change would obviously be unprofitable. But if little diversion occurs and substantial new business develops, the new service is definitely advantageous from the standpoint of both the companies and the customers. Price discrimination of this type offers substantial possibilities for improved utilization of resources in the industry. However, to price such service so low that total profits are reduced is obviously unwarranted. It has been well said that "there is no sense in pricing a product below cost and there is no use trying to fool one another about catch-names like air coach."¹⁷

Indications are, however, that the airlines may change from their present policy of offering over 85 per cent of their services as de luxe or first-class to one of offering over 50 per cent air coach within a comparatively short time, in an effort to meet economic conditions affecting the travel markets. This will affect aircraft manufacturers as well as the airlines. To the manufacturers it means a re-evaluation of the new transport designs on their drawing boards in order to achieve every bit of payload capacity through quick and cheap conversion to high-density seating.¹⁸ For the airlines it will mean mass market sales promotion and perhaps a universal adoption of the installment selling plan introduced by Pan American World Airways in the foreign field.

¹⁷ See "The Air Coach Dilemma," *American Aviation*, August 15, 1949.

¹⁸ See Lee Moore, "Switch to Coach May Alter Plane Design," *Aviation Week*, November 10, 1952.

The coach market will, however, be more sensitive to economic changes and definitely more seasonal than first-class.¹⁹

Airline Public Relations

In developing passenger traffic the conduct of public relations has played a very important part. This has involved contacts of all kinds in order to establish and maintain goodwill not only toward individual airlines but toward the air transportation industry as a whole. Airline public relations activities have endeavored to pave the way for favorable legislation, desirable trade relations, advantageous financial connections, and increased demand for their services.

The policies and actions of airlines seem to indicate a difference of opinion as to just who constitutes the airline public, in terms of public relations activities. Many airlines have come to recognize their employees as a very important part of their public relations program. Some companies carry out their public relations programs through representatives in different regions. These operate with the purpose of considering the local customs, tastes, and opinions of each area. It may be said that the public of any airline would include the following:

- Employees
- Passengers, present and prospective
- Competitors (airlines and other transportation agencies)
- Suppliers of planes and equipment
- Communities
 - 1. Local
 - 2. Area surrounding and between terminal points
 - 3. National
- Newspaper profession
- Readers of newspapers and magazines
- Professional groups
- Stockholders and prospective investors
- State and federal government agencies and officials
- Educators

¹⁹ In February, 1954, United Air Lines reported: "The seasonal swings in the airline business are again growing more severe after a couple of years when they seemed to be flattening out. Contributing to this undesirable situation is the rising percentage of low fare air coach traffic. The people who ride air coach or tourist seem less interested in travel in the off-seasons than the business man who goes first-class. From the busy summer months of July, 1953, the load factor on first-class flights dropped seasonally from 70% to 57%, in February, 1954 or 13 points. But air coach load factor fell from 79.2% in July to 60.9% in February, a decline of 18.3 points. The number of passengers per plane declined three times as fast from July to February in coaches as in first-class flights." A check by the *Wall Street Journal* with American Airlines and Trans World Air Lines disclosed a similar trend.

Seemingly, the importance given to any or all of the specific groups of the public varies with different airlines. Several companies consider the establishment of the proper attitude between labor and management as the biggest job of their public relations departments. These companies are attempting to build public relations from the ground up.

Civil officials in various communities served by an airline, prominent businessmen, other airlines and other transportation agencies, legislators in states where a line operates, and governmental agencies (all of which are contacted by the traffic department of an airline) are considered important parts of the public with which most companies are concerned.

The job of building and maintaining goodwill toward individual airlines is carried on by nearly all companies, but there is no uniformity in the terminology used in designating these departments. They are known variously as departments of public relations, publicity, public information, advertising, education, and traffic. Sometimes contacts of company executives and/or company representatives with the various segments of an airline's public are relied on to do the complete job. In companies with the most thorough public relations systems, every member (labor and management combined) of the organization has been included in the program.

Public relations work takes many forms, including writing, lecturing, photographing, escorting tours of visitors about airports and maintenance bases, and co-operating with the press. The person who does public relations work deals with anyone who wants to ask a question about an airline. The public might be children, writers, newspaper reporters, photographers, program chairmen for fraternal, business, and women's clubs, and anyone else who is interested in air transportation. Through public relations activities, newspapers and magazines are given news and photographs which will be of interest to the public and which will bring the airlines before the public in a favorable way. Getting favorable attention in newsreels and other moving pictures, influencing famous people to fly, and attending business shows, conventions, and meetings of people who travel extensively are a few other public relations activities.

Most airlines consider it a good policy to have a general publicity or promotional program worked out for the year. In this program will be indicated the thing to be emphasized most at specific times and the kind of effort each company unit is expected to contribute.

An up-to-date calendar of events, such as festivals, sports, contests,

historical events, state and national holidays, etc., prevents the overlooking of many good promotion possibilities and provides the outline for the bulk of a year's promotional plans. As each year's activity determines the worthwhile promotions and adds to the list of opportunities, the calendar becomes more important.

The newspaper and magazine are used to place paid advertisements and to get the airline news to the reading public. News items deal with such things as:

Passenger lists—Names of prominent people taking trips by plane will make news. (Prominent politically, socially, in theater, sports, foreign, or business world.) Pictures of prominent people on a plane interviewing airline officials, with some member or members of the trip crew, or enjoying some specific airline service give the public interesting news.

Traffic and volume of trade

Resort, business, and club travel

Vacation travel and vacation spots

Student travel

Airline personnel

Management activity on policy

Services—change of, new services, regular services, emergency services

Some phase of the line's operation

Spot news—presented to bring goodwill and to avert criticism of the line

Air transportation has reached a stage of development where it can consider itself grown to man's size and can therefore conduct itself as a very vital, matured, and dignified business. The circus-type ballyhoo, so often practiced in the industry's early years, will probably become less and less used and considerably subdued in public relations work. America is air-minded, and so various aspects of airline work will always be newsworthy; but news will no longer have to be "manufactured."

The public is, however, still generally ignorant of the development of commercial air transportation as a whole and of its future potentialities. Heretofore not enough has been done to interpret the airline industry to the public in the language of people's thoughts, habits, and personal interest. This is the job of public relations men and women.

Chapter

15 * AIRLINE PASSENGER HANDLING¹

THE success or failure of an airline or any other service organization depends almost entirely upon pleasing its patrons with the service rendered. No matter how excellent a selling job is performed, failure to provide the service sold will inevitably lose the patron for future business. During an ordinary trip, a passenger contacts a very small part of the personnel of an airline; yet the passenger's opinion and future use of the services of a particular company are entirely dependent upon the treatment received from station employees, pilots, hostesses, and sales personnel.

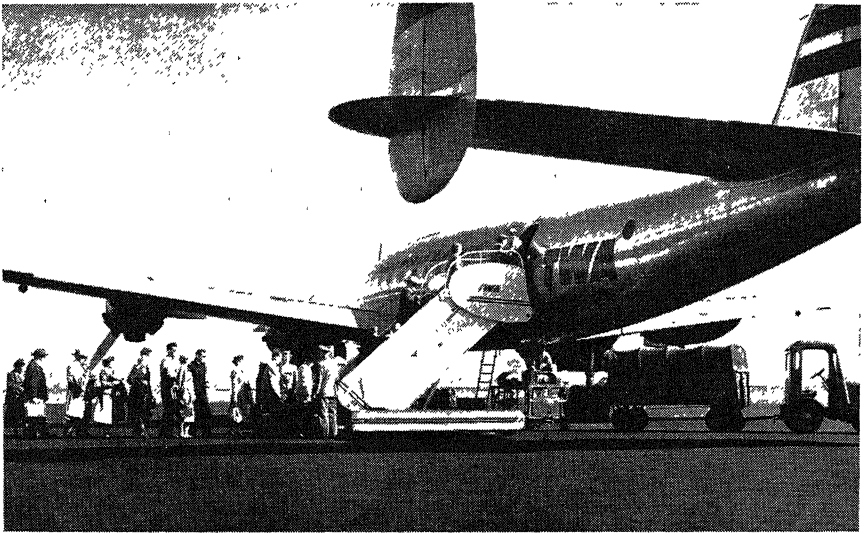
Airline experience has shown that passenger goodwill can be maintained even in spite of inconvenience, flight cancellations, and delay if the employees handling passengers are cheerful and courteous and exhibit a friendly and understanding attitude. While it is fundamentally the job of those personally contacting passengers to build goodwill, this can be accomplished only if the employees on whom such a responsibility rests are supported from behind the scenes with prompt and accurate information concerning flight operations, prompt handling of reservation requests, and a multitude of other services provided by the respective departments of an airline.

Perhaps no single feature acts more quickly to determine an outsider's opinion of an airline than the personal appearance and conduct of its employees. Airline employees when on duty at city ticket offices or at airports should, therefore, maintain a businesslike manner and attitude, avoiding unnecessary loud talking or other boisterous conduct. Problems relating to operations should not be discussed between employees in the presence of passengers since the technical

¹ For a more detailed discussion of this subject see William L. Grossman, *Air Passenger Traffic* (New York: Chemical Publishing Co., Inc., 1947); Morris B. Baker, *Airline Traffic and Operations* (New York: McGraw-Hill Book Co., Inc., 1947); Gene Kropf, *Airline Traffic Procedures* (New York: McGraw-Hill Book Co., Inc., 1949).

terms sometimes involved may be confusing or misleading, resulting in adverse criticism. An alert and aggressive sales policy should be the objective of all airline employees, not simply that of those primarily charged with sales work.

Many of the first contacts between an airline and prospective passengers occur when the prospect makes a telephone call to the airline office. Obviously, persons sufficiently interested to inquire about airline service are potential customers, and a little well-directed effort may secure and maintain profitable traffic. A passenger's opinion of an airline may be as readily formed through telephone conversations with employees as by personal contacts. A satisfactory and pleasing



Courtesy: Trans World Airlines

FIG. 33. Passengers boarding.

impression from a phone call results if the conversation is clear and distinct. Equally important is the attitude or "tone" of a conversation. A friendly and co-operative approach is usually the determining factor in the results obtained. Regardless of the purpose of a call made to an airline, or by whom made, it should be so handled by the receiving employee in such a way as to make the person glad he called.

• Reservations

All space (seats) on airlines are reserved² for several reasons: (a) Reserved space is part of the first-class accommodation and service demanded by most airline travelers. (b) Airplanes have definite limi-

² This applies to coach-type, as well as to regular, services on most airlines today, al-

tations on the amount of payload that can be carried over varying distances. (c) Airlines must obtain the greatest possible use of the available seats on each airplane. At the same time, because of the limited number of seats to an airplane, the passenger must be assured of space before starting his journey. Unless fares were lower than on a reserved basis and service was frequent, very few passengers would be satisfied to go out to an airport on the mere chance that a seat might be available. (d) Control of available space (seats) is necessary to prevent sale of more space on one or more portions of a flight than is available on that portion. When such an "oversale" occurs, and if there are no cancellations, an airline must then deny transportation on the flight to at least one passenger who has a reservation, thus risking ill will or, possibly, legal liability.³

There are almost as many different types of reservation systems as there are airlines. They all have a common purpose, however, which is the elimination of the bottlenecks and delays which air travelers find so irksome.

The most common reservation systems are operated as follows:⁴

1. All space is controlled by one central reservations office located near the geographical center of operation of an airline. Under this system, which is sometimes called the "automatic sales procedure," airline offices out on the line, after referring to a chart indicating space availability, are able to give the passenger immediate confirmation of all on-line space desired. Then these offices record such sales with the central reservations control office. Such a system has many advantages: (a) It affords immediate confirmation of on-line space. (b) Favorable passenger reaction results from better and quicker reservations service. (c) There is a certain competitive sales advantage over other airlines using more cumbersome systems. (d) There is a decrease in telephone calls to passengers as the result of confirmation on the original call. (e) Company messages by teletype or otherwise are lessened. (f) There is elimination of what is known as "shopping for space" and keeping the prospective passenger uninformed for long periods of time. (g) There is better utilization of space, as it is centrally controlled by experts. (h) The entire reservations picture at any one time is available in one place.

2. Space is allotted to the individual stations of an airline on the

though at first, under CAB regulations, a coach reservation was not made without the sale of a ticket.

³ See Grossman, *op. cit.*, chap. xi.

⁴ See Kropf, *op. cit.*, pp. 44-45.

basis of the normal needs of each point. If more space is needed, it has to be obtained from another station located behind the requesting station on a particular route. Under this system there is the danger that space allotments to individual stations will not be adequate under varying traffic conditions and that stations will continue to hold space they cannot sell. Continuous traffic studies, however, enable most airlines to determine quite closely the number of seats each station should normally sell.

Reconfirmation

Starting in the middle of 1952, in an effort to reduce the number of "no show" passengers (those failing to claim reserved space), the airlines began to require passengers, who had not given a telephone contact on making their reservations, to contact the airline at the city where their trips began in order to advise the carrier, at least six hours in advance of a flight's departure, of their intention to use their reserved space. Otherwise reservations would be canceled and seats sold to others. Similar reconfirmation was required at each city during a trip where a stopover of twelve hours or more was made, and at each city from which the return or continuing portion of a round trip, circle trip, or open-jaw trip commenced (these terms are defined on page 421) after a layover of twelve hours or more. Such reconfirmation had to be made with the airline on which the space was held. Probably nothing the airlines have ever done in connection with passenger-handling caused more annoyance than this rule did to some passengers. The airlines, however, felt that the benefits not only to themselves, but to passengers as a group, outweighed the disadvantages.

In June, 1954, that part of the Reconfirmation Rule was discontinued which required a passenger, who had not given a telephone contact to the airline at the city where his trip was to begin, to advise the airline at least six hours before flight time of his intention to use his reservation. Passengers were generally dissatisfied with this part of the rule, which they considered unduly complicated. Its real purpose and meaning was often misinterpreted so that many passengers thought they had to reconfirm *every* reservation. Experience, in fact, taught them that such a procedure was the safest, if not absolutely necessary. As of June 15, 1955, the reconfirmation rule was abandoned entirely to meet the growing passenger complaint that the entire process was unreasonable from their standpoint.

Flight Forecasts and Advisories

When a passenger buys a ticket on an airline, he expects and deserves to know whether the flight for which he is paying will operate on schedule. A passenger resents being led to believe that his flight will operate as scheduled, only to find it canceled or delayed. He also does not receive the service to which he is entitled if he is discouraged from flying in advance only to find later that the flight has operated through to completion.

To assist employees charged with the handling of passengers, scheduled flight forecasts or advisories are issued. These are designed to inform local stations and traffic offices of what may be expected in the way of flight operations for the period covered by the advisory message. On most airlines, flight forecasts are issued for twelve-hour periods and are supplemented four hours before expiration with a new advisory.

The flight advisory is not necessarily an absolute and unchangeable plan of operation, since conditions may vary quickly at times and thus change the operations proposed. However, the advisory does represent what the airline flight dispatcher anticipates and is therefore a good indication of what may be expected and what information may be given passengers concerning the operation of flights in which they may be interested. At most times, flight dispatchers, with the assistance of meteorologists, can predict the clearance of flights in advance when an analysis of the existing weather conditions and the weather maps available shows no indications of unfavorable flight conditions over the territory in question. Less frequently, flight dispatchers cannot state with any exactness a number of hours in advance what the conditions may be, and accurate information can be given only after analysis of later weather reports. This condition is neither pessimistic nor optimistic; and the flight in question may be cleared to destination, delayed, or canceled, depending on the outcome of the conditions existing at the time of clearance. If conditions permit, the flight will be cleared if the weather is above the standards prescribed for flight operations. Whenever weather reports indicate that a flight will not be able to operate, flight dispatchers usually cancel its operation as far in advance as possible. The only reason that a decision concerning the operation of a flight will be deferred is because a flight dispatcher feels that there is a possibility of safe operation but must necessarily delay his decision until favorable weather reports are received.

When describing the anticipated operation or status of flights scheduled to operate, or presently operating, three terms are commonly used:

1. *Routine.* The flight will operate without interruption on or about its published schedule.

2. *Subject.* The flight dispatcher plans to operate the flight if late weather reports are above minimum standards, although a definite decision will be made later.

3. *Cancel.* The flight will not be operated.

Special passenger-handling problems are created in the case of "subject" and "cancel" operations. In such cases, it is necessary for the station concerned to keep in touch with passengers scheduled to depart on the "subject" flight and to make tentative arrangements for either eventuality, if the flight does or does not operate. Upon receiving a "subject" forecast for a trip affecting a given station, airline employees usually begin to make the necessary arrangements for the possibility of dispatching passengers for the flight to their destination by some means of ground transportation. Generally, a flight dispatcher will qualify a "subject" forecast with the term "likely" or "unlikely," meaning, respectively, that, although the flight has not as yet been definitely cleared, its operation is considered likely and, conversely, that, although there is yet the possibility of the operation of a flight, its operation is considered unlikely. These qualifications provide additional information concerning the likelihood of operations and permit more freedom in the primary arrangements to be undertaken by station personnel. If a flight forecast indicates the possibility of cancellation at a given station, tentative arrangements are usually made in order to care for the transportation and accommodation of passengers who may be deplaned at that point either temporarily or permanently, as well as to provide for passengers arriving on connecting airlines. Probably no other phase of passenger handling calls for greater ability, experience, and tact than when operations are irregular or uncertain.

Care should be taken to avoid making any statement which may cause doubt or fear in a passenger's mind concerning the operation of a trip. Many passengers are frankly afraid or worried by what they feel is "bad" or "doubtful" weather, as well as by an apparent indecision on the part of the employee with whom they may be discussing the matter. If a passenger is told that a flight is "doubtful," or the weather is "bad around Kansas City," or "I don't know whether

this flight will operate or not," this passenger may cancel his reservation when actually there is only the usual risk or doubt involved in the flight. No airline ever clears a flight unless, in the opinion of a flight dispatcher, its operation is absolutely safe.

Ticketing

All rates, fares, charges, rules, and regulations concerning the transportation of airline passengers and their baggage are published in airline passenger tariffs on file at all stations. Except as otherwise provided in airline tariffs, tickets are valid for a period of 120 days after they are issued and expire at midnight on the date of expiration. Tickets will, however, be extended for passengers who are unable to obtain a reservation on the date of expiration due to lack of space or flight cancellation, but for a time not to exceed the first comparable schedule on which space is available.

Tickets are of various types:

One Way. A trip in one direction only between two stations.

Round Trip. A trip from one station to another and return to the station of origin when using the same airline in both directions.

Circle Trip. A trip from one station to two or more stations and return to the station of origin; for example, a trip from Dallas to Atlanta via Delta Air Lines, Atlanta to New York via Eastern Air Lines, and New York to Dallas via American Airlines.

Open Jaw. A trip from one station to two or more other stations, involving travel in both directions; for example New York to Seattle, Seattle to Los Angeles, and Los Angeles to Miami.

Open Date. A ticket issued without any definite reservation in advance.

Interline. Indicates the use of two or more airlines.

Joint Issue. The issuing of two or more tickets in connection with each other to cover one complete trip.

Passengers are permitted to carry 40 pounds of baggage free of charge in the United States and 66 pounds on foreign flights. This is the general rule to which there are some exceptions. For example, on some domestic flights, such as San Francisco to Honolulu, 66 pounds are allowed, while on some foreign flights, such as Seattle to Vancouver, only 40 pounds are allowed. There are also special rules; for example, United States-flag lines between San Francisco and Vancouver will handle only 40 pounds of baggage free, while foreign-flag

airlines between those points will handle 66 pounds. This free baggage includes handbags, suitcases, brief cases, etc. Any baggage or personal belongings above the full weight allowance are charged for at the excess baggage rate published in airline passenger tariffs. Excess baggage charges are collected at the point of origin for the entire one-way trip to destination, provided there is no stopover en route, in which case the excess charges are made from the point of origin to the point of first stopover. Baggage is usually checked only as far as space is confirmed.

Routing

Fares quoted in airline tariffs provide for routing on a much less generous basis than do rail or bus tariffs. Airline fares are applicable only over a particular routing as specified; and if no routing is specified, the most direct route will apply. Where there is more than one applicable route, at a published fare, the passenger may specify the desired routing prior to beginning a trip. If he specifies that he desires an alternate routing, which is authorized at the same fare, his ticket is stamped "optional routing via (name of carrier of alternate routing)." When this is done, the passenger may choose any one of the alternates specified without further endorsement at any time prior to the start of the trip involving the alternate routing.

Any other rerouting which involves a change in participating carriers must be made by a signed endorsement of the ticket by a representative of the first participating carrier from which the routing is changed and may be secured by the direct request of the passenger to such representative. The fare for rerouting is computed as follows: The fare will be that which would have been charged had the revised routing been purchased at the point of origin; however, after a trip is started, a one-way ticket may not be converted to a round-trip or circle ticket at a corresponding fare reduction. Any difference between the fare of the revised routing and the original fare paid will be collected from the passenger.

The route selected by an individual passenger is usually based on one or more of the following factors: (a) the directness of the route; (b) the fare; (c) the combinations of attractions on one route versus another; for example, some passengers on a transcontinental journey choose the route that takes them over the Grand Canyon; (d) the sales effort put forth by individual airlines; (e) the type of equipment provided by one airline as compared to that of another; (f) the services of one company as compared to those of another, coupled with per-

sonal desire of a passenger to patronize one company rather than another; and (g) the desire to go one way and return another.

In the event of a change in routing due to flight cancellation or lack of space, an airline will (a) allow the passenger to retain the unused portion of the ticket for use on a later flight; or (b) refund the value of the unused portion of the ticket; or (c) endorse the unused portion of the ticket for purposes of rerouting; or (d) reroute the passenger to destination by air, rail, or other carrier and without collection of a higher fare, if a higher fare prevails for the routing designated, or, if a lower fare prevails, refund the difference to the passenger.

When a passenger is rerouted for a reason not within his control and where the rerouting calls for a fare differential in excess of that which the passenger has paid, the carrier failing to perform the service, or the line which has canceled its flight, retickets the passenger and absorbs the fare differential, except in cases where a joint fare exists, in which case the regular proportion of the fare will govern the proportion of the absorption. There should be no chance of confusion concerning the responsibility of the airline when a flight is canceled or when a scheduled stop is omitted; but when failure to make connection occurs, airlines agree that the responsibility is that of the line which failed to arrive at the point of connection in time for the passenger to catch the flight on which space was held. Most airlines will, therefore, absorb the additional amount of fare caused by rerouting when this rerouting is due to flight cancellation, missed connection, or omission of a scheduled stop.

If it is the passenger's desire to be rerouted, the price of the ticket is refigured on the basis of the fare that would have been charged had the revised routing been purchased at the point of origin. If a higher fare prevails on the new routing, the difference will be collected. Should a lower fare prevail, the difference will be refunded.

Ticket Refunds

Unused tickets or portions of unused tickets will be refunded by airlines upon surrender by the original purchaser, subject to the following conditions:

1. A passenger canceling of his own volition will be refunded the difference between the fare paid and the fare for the distance traveled.
2. Upon the cancellation of a flight by an airline due to weather conditions or other reasons beyond the control of the passenger, the

passenger, with certain exceptions, will be refunded that part of the fare paid which is applicable to the remainder of the trip.

3. Refunds on tickets issued against government travel orders, Air Travel Cards, or one-trip air travel orders or tickets stamped "refunded only at general office" will be made only upon request to the general office of the airline.

4. Refunds which may result from voluntary cancellation by passengers or from a change in routing made at a passenger's request will be made only upon request to the general office of the airline.

5. Lost tickets will not be replaced or refunded until thirty days after the date passengers make application to the general office.

6. Holders of air coach tickets who cancel their reservations less than three hours before scheduled departure time or fail to use their reserved seats will be subject to a service charge of 20 per cent of the value of the ticket, with a minimum charge of \$5.00, or the value of the ticket if it is less than \$5.00.

Chapter

16 * AIR EXPRESS AND FREIGHT DEVELOPMENT

ONE of the most interesting aspects of air transportation since the close of World War II has been the development of both air express and air freight, usually lumped together by the air lines and called "air cargo." The growth of these two types of service is shown in Table 45. In the last few years new types of service have become available; new carriers have entered the field; rates have been markedly reduced; and the volume of service has greatly expanded. But in this period of rapid development, there has been a tendency to lose sight of the fact that air cargo is really not new, that some aspects of it are older than the present airlines themselves. There has also been considerable misunderstanding of the history of air cargo development and of the agencies most responsible for its present status. In order to understand the problems that must be resolved if air transportation is ever to develop as a major factor in intercity transportation of property, it is necessary, therefore, to review the background of air cargo growth and to indicate the agencies most responsible for its development at various times.¹

In recent years the volume of air freight has grown very rapidly while air express has remained relatively constant. Yet air freight and express combined have never accounted for as much as 1 per cent of the total intercity movement of freight traffic. Forecasts of potential air freight, in particular, usually predict further expansion as rates are progressively lowered; nevertheless, even the most optimistic predictions foresee a volume of traffic which for some time to come will,

¹ For a more detailed discussion, see John H. Frederick and Arthur D. Lewis, "History of Air Express," *Journal of Air Law and Commerce*, July, 1941; John H. Frederick, "American Air Cargo Development, *Air Affairs*, Autumn, 1947; Richard Malkin, *Boxcars in the Sky* (New York: Import Publications, Inc., 1951).

TABLE 45
DEVELOPMENT OF AIR EXPRESS AND AIR FREIGHT, 1926-54

Calendar Year	Express Ton-Miles*	Freight Ton-Miles Combination Airlines*	Freight Ton-Miles All-Cargo Certificated Airlines§	Freight Ton-Miles Noncertificated Carriers	Total
1926.....	996				996
1927.....	12,841				12,841
1928.....	58,913				58,913
1929.....	69,898				69,898
1930.....	100,666				100,666
1931.....	220,657				220,657
1932.....	289,512				289,512
1933.....	422,860				422,860
1934.....	597,293				597,293
1935.....	1,089,802				1,089,802
1936.....	1,860,809				1,860,809
1937.....	2,156,070				2,156,070
1938.....	2,173,706				2,173,706
1939.....	2,705,614				2,705,614
1940.....	3,469,485				3,469,485
1941.....	5,242,529				5,242,529
1942.....	11,691,208				11,691,208
1943.....	15,117,925				15,117,925
1944.....	17,094,029†				17,094,029†
1945 Jan.-June.....	11,926,481†				
1945 July-Dec.....	9,235,413	1,402,241			22,564,135‡
1946.....	23,788,392	14,822,325		25,183,610§	63,794,327
1947.....	28,766,659	35,911,554		47,409,062§	112,087,275
1948.....	30,092,833	71,283,727		48,115,218§	149,491,778
1949.....	27,773,669	95,227,983	10,541,146	45,000,000||	178,542,798
1950.....	37,279,035	114,072,045	58,420,386		209,771,466
1951.....	41,268,219	102,356,646	80,851,306		224,476,171
1952.....	41,324,306	119,501,666	92,494,311		253,320,283
1953.....	43,470,800	134,460,726	89,902,278		267,833,804
1954.....	41,178,000	147,093,000	76,792,000		265,063,000

* For domestic certificated airlines, trunk and feeder.

† Includes both express and freight since there was no segregation by the Civil Aeronautics Board of freight and express statistics prior to July 1, 1945, and no airline carried freight as distinct from air express until American Airlines started doing so in 1944.

‡ Calendar year of 1945.

§ Includes the leading noncertificated carriers during those years: Air Cargo Express, California Eastern Flamingo, The Flying Tiger Line, Mutual, Riddle, Slick Airways, U.S. Airlines, and Willis.

|| Estimated. Date for noncertificated carriers not available after 1949.

Source: Civil Aeronautics Administration, *Statistical Handbook of Civil Aviation* (Washington, D.C., 1954). 1954 estimate by CAA.

in absolute size, still be only a minor part of the total movement of commodities in the United States.²

It is probable, therefore, that the importance of air freight in the

² In 1952, for example, percentage distribution of intercity freight traffic in the United States was reported as follows:

Steam railroads.....	55.6%
Motor trucks.....	16.5%
Great Lakes carriers.....	8.0%
River and canal carriers.....	5.7%
Oil pipe lines.....	14.1%
Electric railroads.....	0.1%
Air carriers.....	Less than 0.1 of 1%

nation's commerce will never be measurable in terms of its contribution in ton-miles to total intercity traffic. Rather, its importance to society will be measured in terms of unique benefits—chiefly arising from its speed—to certain industries in particular and to commerce in general. In many industries, the speed and other advantages which air freight offers have made possible marked improvements in production and distribution methods and in the quality of products delivered to consumers. Eventually, it is hoped that these benefits will result in a lower over-all cost to consumers. To commerce in general, air freight has already demonstrated its importance for emergency shipments of various kinds and for the new competitive influence which it represents in transportation. The importance of air freight to the airlines will, of course, be measured by the gross revenue from such traffic.

Early Air Express Development

One of the first experiments in the transportation of property by air in the United States occurred in the winter of 1919, when the American Railway Express Company, in testing the possibility of transportation of express on scheduled flights, loaded a Handley-Page bomber with 1,100 pounds for a flight from Chicago to New York. A series of accidents caused the flight to be canceled at Cleveland and the goods to be sent the rest of the way by rail. From that time until 1926, there was some minor development of air express service by fixed-base operators; but the lack of government subsidy, combined with the early stage of aeronautical efficiency, resulted in very high charges, which limited the use of the service by shippers.

During the latter part of the 1920's, the use of air for property transportation was stimulated by the transfer of the air mail service from the government to private carriers. The carriage of mail on fixed schedules, with its constant source of revenue, provided the basis for the transportation of express on scheduled flights at rates considerably lower than they had previously been, thus encouraging a wider use of the service. The way was open for the development of air express as we know it today.

In 1927 the American Railway Express Company entered into contracts with four airlines, establishing an air express service under essentially the same type of arrangement that has been followed since that time. These airlines were: National Air Transport, operating between New York, Chicago, and Dallas; Boeing Air Transport, operating between Chicago and San Francisco; Western Air Express, operating between Salt Lake City and Los Angeles; and Colonial Air

Transport, Inc., operating between Boston and New York. The express company contracted to perform local pickup and delivery service, as well as any necessary surface transportation to off-airline points. It also conducted all direct relations with the public and handled accounting, claims, and other business functions. The airlines' participation consisted of the loading and unloading of aircraft and the actual line-haul transportation. (In fact, from that day to this, the American Railway Express Company and its successor, the Railway Express Agency, have been strictly ground-service organizations. They have never actually flown a pound of express.) Revenues from air express operations were divided between the express company and the respective airlines on a specified percentages basis after deduction by the express company of out-of-pocket costs resulting from its pickup and delivery service and from advertising, sales, and other such functions. Originally, 25 per cent went to the express company and 75 per cent to the airlines, but it was subsequently changed to 12½ per cent to the express agency and 87½ per cent to the airlines.

By the end of 1929, the system which the Railway Express Agency assumed after the reorganization of the American Railway Express Company included the ten most important airlines of the country, offering direct service to eighty-two cities. In that year these airlines transported 75 per cent of the total air express of the country. In addition to the airlines under contract with the Railway Express Agency, there were numerous small mail carriers as well as passenger operators who were carrying air express.

In 1932, American Airways, Transcontinental and Western Air, Eastern Air Transport, Trans-American Airlines Corp., U.S. Airways, Pennsylvania Airlines, and Ludington Airlines jointly organized General Air Express, a subsidiary service organization managed by an interline committee, to provide a unified express service over their routes. Pickup and delivery were handled by the telegraph companies,³ and provision was made for a uniform waybill and a single uniform charge for interline shipments. This was the first major rival of the Railway Express Agency service, and rates were established substantially below those of the Railway Express Agency. There followed a competitive period during which the rival organizations successively undercut each other, so that, for example, the ton-mile rate between New York and Chicago was reduced from \$1.19 in Decem-

³ The system was well adapted to the small packages then moving by air, and it associated the speed of the telegraph with air transportation in the minds of shippers and receivers.

ber, 1931, to 87 cents in June, 1933. During the period of its operation, General Air Express handled approximately one-fourth of the total air express traffic.

In 1935, all but one of the airlines belonging to General Air Express discontinued their arrangements with that organization and signed contracts with the Railway Express Agency. Transcontinental and Western Air fought such an alliance of the railroads and the airlines and for a short time tried to promote air express as an independent operator, but in 1937 it too joined the Railway Express Agency. By that time, the latter organization not only covered all the major domestic airlines but also had arrangements for rendering express service to Canada, Mexico, and other countries of the Western Hemisphere.

Several reasons were given for the abandonment of General Air Express and the consolidation under one organization: (a) The Railway Express Agency arrangement provided a uniform service. There would be but one waybill, one bill of lading, and one airway bill. (b) Shipments in many instances had become too heavy for the telegraph company messengers to handle. Trucks as provided by the Railway Express Agency would be more efficient. (c) It was felt that there was a decided waste in having two organizations engaged in advertising and soliciting the same traffic. Not only was there an overlapping effort in solicitation, but there was a tendency for the two to fight for each other's traffic rather than to develop new traffic. (d) The most economical and serviceable routing could now be employed irrespective of which airline the shipment went by. (e) The unification of ground auxiliary systems would reduce costs of pickup and delivery, since more traffic could be spread over the same overhead.

At this time it seemed to the airlines concerned that they had no other alternative, if they were to remain in the express business at all, than to abandon General Air Express and join the group served by Railway Express Agency with its greater traffic-generating power. It is doubtful, however, if this amalgamation would have been brought about as easily had the airlines not been in a somewhat chaotic state following the 1934 air mail contract cancellations and had they been in a stronger financial position and so able to allocate the substantial funds required for the creation of an airline-owned pickup and delivery system.

The arrangements made between the airlines and Railway Express Agency were in the form of contracts between the agency and each

individual airline. Each contract was separate and distinct, with contractual relationships running between each airline and the Railway Express Agency but not among the airlines. Each contract, however, had the same terms and provisions, and all airlines were to operate in the same relationship to the Railway Express Agency. With certain modifications, the arrangement between the Railway Express Agency and the airlines remained substantially the same until 1954.⁴ The revised contract which became effective August 1, 1954, contained no guarantee of 10 per cent of expense as profit for the Railway Express Agency, as formerly; reduced the former 12½ per cent of expense allowance covering administration and overhead to 9½ per cent; and changed the previous revenue split of 80 per cent to the airlines and 20 per cent to R.E.A. to 80.69 per cent for the airlines and 19.31 per cent for R.E.A.

The unification of the air express service that resulted after the airlines contracted with Railway Express Agency alleviated the former disadvantages arising from having two competing agencies, but the results of the single-company operation were in some ways disappointing. For example, it was thought that efficiencies brought about would permit reductions in rates and thereby stimulate traffic development. However, from 1937, when the air express service became unified under the Railway Express Agency, until well into the war period there was virtually no change in the air express rate level.

From this review of the early development of air express, it will be seen that the airlines regarded the transportation of property as an important part of their activities. In fact, the industry as a whole felt that air express would develop more rapidly than passenger traffic and centered many of its activities about that service. All this took place during the period of experimentation, and it was assumed that air express transportation would be the proving ground of commercial flying and give the airlines experience in handling intricate and hazardous operating problems. Many early predictions of the future use of air transportation foresaw the immediate acceptance of this method of transportation; but these hopes were in vain, as developments showed.

Some of the reasons why air express transportation did not develop to the extent expected in the earlier years were: (a) The speed of air express, probably due to its lack of reliability, was not of sufficient importance to most shippers, then using rail express, to warrant their

⁴ *Railway Express Agreements*, 4 CAB 157 (1943); *Railway Express Agency, Inc.*, CAB Dockets 5115, 5115 A1, 5115 A2 (1951-54).

making the change and bearing additional transportation costs. (b) Lack of a nationwide, co-ordinated air express facility retarded development. Attempts to develop traffic were carried on independently by several individual operators, with no direct connection with other transport operators. There was no general set of rules for handling, no co-ordinated scale of rates, and no general agreement on the handling of shipments between airlines. (c) Too much emphasis was placed on carrying goods by air, whereas the real problem was in setting up and operating adequate handling and selling facilities on the ground. (d) Many of the airlines organized at this time were inadequately financed to sustain the necessary developmental costs or even to carry on air express operations until the traffic, which might originate at lower rates, would be sufficient to justify the service.

A National Air Express System

The contract between the Railway Express Agency and the airlines made possible a national air express system. Experience had convinced the air carriers that the era of volume use of their services for the carriage of property had not yet arrived. The only advantage they had to offer was that of speed, and only a limited number of shippers appeared to value speed highly enough to pay the necessary rates. Recognizing their obligation to the public to offer the best service possible, but at the same time conscious of their own precarious financial standing and inability to finance a nationwide pickup and delivery service, which was a necessary adjunct to an air express service, the airlines adopted the best alternative open to them and hired the already existing services of the Railway Express Agency. It is a fact that the carriers could not, on their own, particularly during the depression years, have established a service comparable to that offered by the Railway Express. Therefore, their action was, at the time, the most feasible way by which a national system of carriage of property by air could be developed.

The uniform and extensive nationwide coverage provided by the combined Railway Express-airline organization, the devotion of considerable amounts of money for cargo developmental purposes by the airlines, the general improvement in the regularity of air service, and improved business conditions led to steady increases in express traffic.

In 1938 the Railway Express Agency applied for a certificate of public convenience and necessity as an air carrier under the "grandfather" clause of the Civil Aeronautics Act. It did not, however, seek

authority to engage in the operation of aircraft. After some deliberation, the Civil Aeronautics Board decided, in 1941, that the Railway Express Agency should be classified as an indirect air carrier but, at the same time, exempted it from the certificate requirements of the act, thereby permitting it to continue its operations.⁵

In 1942, several of the larger airlines organized a joint research project to survey air cargo possibilities. Later, all the airlines were given an opportunity to participate in the costs of this research and to share in its results, and all of the certificated carriers availed themselves of the opportunity. The group making the study was known as Air Cargo, Inc. For a time it had an independent status, but during the war years was merged with the Air Transport Association.⁶

There is abundant evidence that, prior to our entry into World War II, the airlines were beginning to recognize the potentialities of a real air freight service, as differentiated from the air express or package service. However, before any airline plans for air freight development could be brought to fruition the United States was at war; and all energies and resources were devoted to the creation of a military, domestic, and international air transportation system and the reorganization of their own greatly reduced commercial services to handle priority passengers and property.

Wartime Developments

Although noncommercial in nature, one of the major wartime developments in the field of air freight transportation was the dramatic demonstration by the military services of the potentialities for transporting all types of commodities by air. The widespread operations of the Air Transport Command and the Naval Air Transport Service carried huge amounts of freight to all parts of the world, the total amounting to over 3,334 million ton-miles during the year 1942-45, or nearly 40 times the aggregate traffic carried by all of the domestic airlines from 1926 through the end of the war. In the one year 1945 alone, the military transport services carried 1,805 million ton-miles, or nearly 80 times as much cargo as did the domestic airlines during the same year.

Also, for the first time the speed of air transportation came into its own. Many items which under normal conditions would have been

⁵ *Railway Express Agency, Inc., Certificate of Public Convenience and Necessity*, 2 CAB 531 (1941).

⁶ The completed studies of Air Cargo, Inc., have never been made available to anyone except the subscribing airlines.

highly unsuited to this means of transportation were sent by air, and the nature and advantages of air shipment were, therefore, discovered for the first time by many new shippers and receivers. Between 1941 and 1945, the annual volume of scheduled air cargo (freight and express together) increased by approximately 340 per cent.

Because of the great increase in the demand for air cargo services, as represented by the tremendous amount of air express offered for shipment, the carriers, led by United Air Lines and soon followed by the other transcontinentals, inaugurated daily schedules carrying mail and express only. Of course, during this war period, it was impossible to carry out any long-range plans for air cargo development; but nonetheless the airlines continued working with certain types of shippers to develop cargo use and experimenting with various methods of handling. It became apparent that at least three basic factors were of major importance in determining whether a shipper would use air transportation for a particular shipment: (a) the value of the product; (b) whether the product was perishable or fragile; and (c) whether the speed of air transportation was of value because of an emergency situation, style factors, and the like.

In October, 1944, American Airlines established its "air freight" service,⁷ with rates averaging approximately 44 cents per ton-mile, door to door, with a deduction for those shippers or receivers providing their own pickup and/or delivery service. Originally, service was provided to forty-three cities, but it was expanded to fifty-eight terminal areas in which pickup and delivery service was provided by motor truck operators with whom American Airlines had contracted.

The essential characteristic of the American Airlines air freight service was a somewhat slower over-all speed than air express, for

⁷ It has turned out to be unfortunate that at the time of the organization of General Air Express in 1932 the name "air express" was adopted. This was intended in no way to limit the size or type of property that the airlines desired to carry. The name "express" was a sales device to emphasize the speed of shipment, which was the airlines' main selling point. An effort has, however, been made by the strictly air cargo carriers in urging their applications for certificates before the Board, based upon the airlines' historic use of the word "express," to characterize the airlines' efforts in the property field as having been confined to package business. The airlines hold this to be without foundation since in the earliest days of commercial air transport a bright immediate future was seen for property transportation and any error was on the side of optimism as to the volume and mass of the business that was to be transacted. They also call attention to the fact that the equipment in use in the earlier days could hardly be considered spacious and that there were physical limitations as to what could be carried. As a matter of fact it took many years of patient experimentation and development and the impetus of a war before passenger operations were conducted with fifty-passenger equipment; and the carriage of property has required similar experimentation and developmental effort. See *Testimony on Behalf of American Airlines, Inc., Intervenor*, CAB Docket No. 810 *et al.* (January 15, 1947).

generally larger shipments, at a considerably lower cost. Shipments moving under this service had a "deferred" status, with air express receiving preference in the event of fully loaded planes. The original tariff filed for this service established a rate structure with four commodity classifications, based upon value of the commodity, bulkiness, and similar factors. (See Chapter 9.)

Postwar Developments

For at least a year after the end of the war, most of the scheduled airlines displayed comparatively little enthusiasm for actively promoting air freight; and not until the middle of 1946 had all of them

TABLE 46
DATE OF ISSUANCE OF FIRST AIR FREIGHT TARIFF

<i>Airline</i>	<i>First Tariff Issued</i>
American.....	Oct., 1944
Braniff.....	Dec., 1945
Chicago and Southern.....	Aug., 1946
Continental.....	Jan., 1946
Delta.....	Aug., 1946
Eastern.....	Apr., 1946
Inland ..	June, 1946
Mid-Continent.....	Jan., 1947
National.....	Sept., 1946
Northwest.....	Nov., 1946
Capital (Pennsylvania-Central).....	July, 1946
TWA.....	July, 1945
United.....	Feb., 1946
Western.....	June, 1946

filed tariffs with the Civil Aeronautics Board providing for such service in addition to air express. (See Table 46.) This delay in developing air freight services has been generally attributed to the many problems facing the airlines in establishing their passenger business on a greatly enlarged postwar basis; but there was certainly an indication of a general feeling among airline executives that this type of traffic would not, for some time, yield any significant profit at the rate levels which would be required to promote the business. In this connection it is worth noting that, prior to World War II, the revenue from cargo traffic, chiefly express typically represented about 3 per cent of total airline revenue. To some extent, it is understandable that this attitude should have existed and that the attention of the airlines should have successively shifted from mail to passengers and last to freight. This same order, it may be noted, applies in general to the

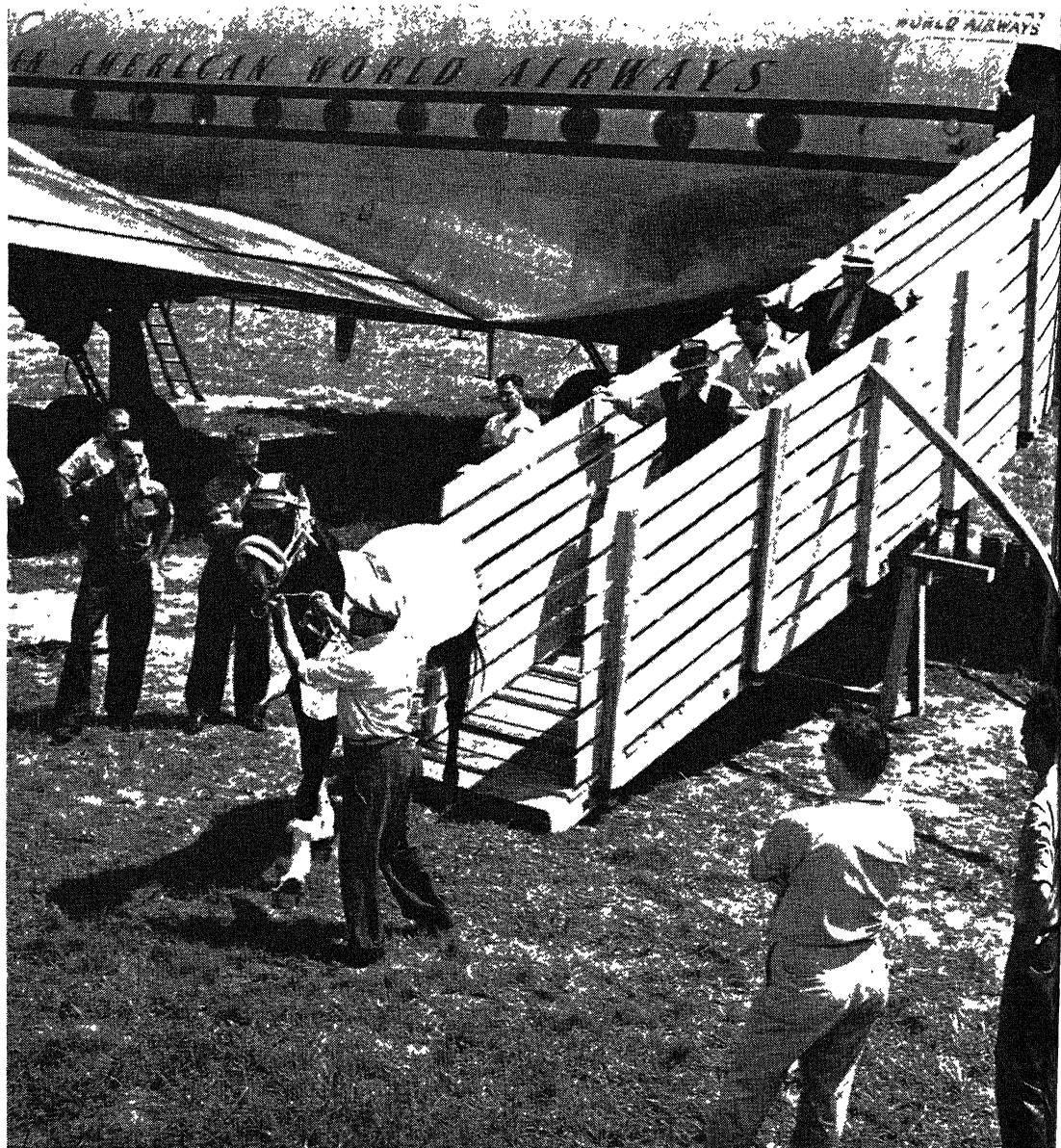
relative importance of speed to these three classes of traffic. The value of speed for both mail and passengers is self-evident. In the case of freight, on the other hand, only a minor portion of the total market for the service is significantly and directly benefited by speed; and, even for these movements, the benefits are not always readily apparent without a considerable period of active development and experimentation.⁸

An immediate effect of the end of World War II was a tremendous increase in the number of air freight carriers. From the few airlines then quoting air freight rates, as distinguished from air express, the number increased so that there arose, within a comparatively short period of time, what amounted to a separate air transportation industry operating more large planes than were owned by all the scheduled airlines before the war.

Thousands of ex-servicemen, flyers and nonflyers alike, enthusiastic about what they had seen the Army and Navy accomplish in carrying things by air, were determined to get into the air freight business. Combined with this more or less natural desire to make some use of their war-time training was the sudden availability of transport-type planes, chiefly C-47's, the Army version of the familiar DC-3. Coupled with the men and planes was the fact that the airlines, fully occupied with their exceptional passenger and express traffic, had not developed air freight in the manner that shippers and others thought possible. A certain number of newcomers to the air freight transportation field, therefore, provided a real service; and for a short time in 1945 and 1946, while transportation facilities of other types were still congested, and for certain types of promotional shipping, these operators met with a certain amount of success.

The airlines had confidently looked forward to developing their freight services over a period of time as equipment especially designed for such services became available, as costs became known, and as rates could be established. They had not expected to have to hurry about any of these matters. But developments after the close of World War II, chiefly the pioneering and promotional activities of the newcomers to air transportation which proved that freight traffic could be developed, forced the airlines to push their plans ahead, perhaps by several years, and to get into the real air freight business before they were always ready or be left out of it entirely. The results

⁸ See U.S. Department of Commerce, *Industry Report, Domestic Transportation, June-July, 1947* (Washington, D.C., 1947), p. 18.



Courtesy: Pan American World Airways

FIG. 34. For overseas shipment, race horses stand air travel better than they do surface travel. Here is an Argentine thoroughbred arriving in New York after a thirty-two-hour flight.

were constantly changing airline rates and methods of quoting rates and rapidly expanding airline services.⁹

No one knows exactly how many noncertificated air freight carriers went into business during 1945 and 1946;¹⁰ but it has been estimated

⁹ See Chapter 9. Air express rates, which had been reduced by about 12½ per cent during the war, were reduced by an additional 13 per cent as of January 1, 1946, bringing their new level to an average of about 61 cents per ton-mile. Scheduled air freight rates were reduced to a level of about 26½ cents per ton-mile in 1946 also.

¹⁰ *Times* filed with the Civil Aeronautics Board, in response to its registration require-

that there were as many as 150 carriers of air freight, in addition to the certificated airlines, operating at one time or another during 1945 and the middle of 1946. These organizations had between 400 and 500 transport-type planes in use, with an average of perhaps 10 employees per plane, or a maximum of 5,000 for the industry. At one time, nonscheduled or contract carriers of air freight were coming into existence at the rate of 40 or 50 a month when equipment was readily available. Toward the middle of 1946, however, while 10 or 20 new operators might enter the field in a month, some 20 or 30 would sell out, combine with others, or just fold up. The result was one of the greatest shaking-out processes that has ever taken place in any field of transportation and was accompanied by many personal tragedies involving the loss of veterans' savings and those of their friends and families. It was bewilderingly rapid, as were all aspects of aviation development directly after World War II. Something like what went on in aviation took place in the motor carrier industry, but it was spread over a period of years instead of months.

In June, 1947, the Civil Aeronautics Board adopted a new Economic Regulation permitting the operation of noncertificated cargo or freight carriers.¹¹ It allowed those operators who had been engaged in the air transport of property on May 5, 1947, and who had applied for certificates of convenience and necessity, to operate as common carriers until the Board had acted upon their applications. The Board handed down its decision in the Air Freight Case in 1949,¹² temporarily certificating four of these operators as common carriers and thus forcing the others, operating under the so-called "292.5 exemption," to suspend operations. The four all-freight or "air cargo airlines" certificated for a five-year period were Slick Airways, U. S. Airlines, The Flying Tiger Line, and Airnews. Later, in 1951, the Board granted Riddle Aviation a certificate to operate as an air freight carrier between New York, Miami, and Caribbean points.

In certificating these specialized carriers, even for a temporary period, the Board took the position that air freight was separate and

ment of 1946, confuse, rather than clarify, any attempt to measure the size of the independent air freight operations. This is so because the CAB registration statements did not differentiate between purely local operators who made occasional freight charter flights and the organizations devoting their entire time and equipment to such traffic. Some operators grew in a few months to considerable size; others shrunk; and still others went out of business during the period covered by the registration statements. The CAB registration statements, therefore, showed acquisition, sale, and leasing of equipment in such confusion that it was impossible to say just how many planes were actually in air freight service at any one time or even how many operators were in the business.

¹¹ CAB Economic Regulations, sec. 292.5. See Chapter 7.

¹² *Air Freight Case*, 10 CAB 572 (1949).

distinct from the air express business of the airlines and should be treated as such; that the air freight business should be placed on a sound basis through the issuance of certificates of public convenience and necessity, rather than to permit operators to continue on the basis of a further exemption from economic regulation; and that the great air freight potential warranted the existence of strictly air cargo carriers alongside the "combination carriers," which are the airlines that transport passengers, mail, express, and freight generally in the same aircraft.

Table 45 shows the growth in freight ton-miles of the strictly air freight or cargo carriers. Of the group, Airnews, which was to have had a restricted operation, never did get started and their certificate was later revoked by the Board. U.S. Airlines, running from Florida to the Northeast, operated but suffered various financial difficulties and did not develop much traffic. The Flying Tiger Line and Slick Airways, the two transcontinental air freight lines, both developed substantial common-carrier traffic, but even they did most of their business on a contract basis with various branches of the Armed Services. In 1953, The Flying Tiger Line and Slick Airways filed an application with the Civil Aeronautics Board to merge, and the Board approved this merger early in 1954.¹³ The companies held that a merger would enable them to improve service to the shipping public by consolidating low load-factor flights, to eliminate inefficient routing, and to alternate intermediate stops, thereby improving delivery time. The merger, however, was never consummated because of labor protection conditions which, the companies estimated, would have cost the surviving company several million dollars.

The Air Freight Potential

Despite the growth in air freight since the close of World War II, its rate of development has been disappointing to many forecasters who had seen a much more rapid increase. For example, in 1948 the Civil Aeronautics Administration predicted that, by 1955, 1,150,000, 000 ton-miles of domestic air freight would move at an average rate of 18 cents per ton-mile. In the Air Freight Case, Slick Airways predicted that 5 billion ton-miles would be moving by 1950 at an average rate of 9 cents per ton-mile. Reference to Table 45 will reveal that nothing like the volume predicted by Slick, as well as by others at that

¹³ *Flying Tiger-Slick Merger Case*, CAB Docket No. 6047 (1954).

time, moved in the year indicated.¹⁴ In 1952 the Civil Aeronautics Administration again reviewed the situation and predicted that domestic commercial air freight volume would rise gradually to an estimated 400 million ton-miles by 1955, and to 600 to 800 million ton-miles by 1960, depending on the vigor with which the air carriers developed the potential and assuming a continued high level of prosperity for the national economy and no substantial change in rates or equipment during the period forecasted.

In 1952 Lockheed Aircraft Corporation estimated that by 1958 from 600 million to one billion ton-miles of air freight would move on the domestic airlines. The difference of 400 million ton-miles, as shown by the shaded area in Fig. 35, depends on the airlines' active development of traffic and their use of newer and more economical cargo aircraft as soon as these become available. The lower figure is a straight projection of present trends of expansion with obsolete equipment, whereas the higher figure represents what might be possible with the introduction of newer equipment and streamlining of sales organizations in selling air freight.¹⁵

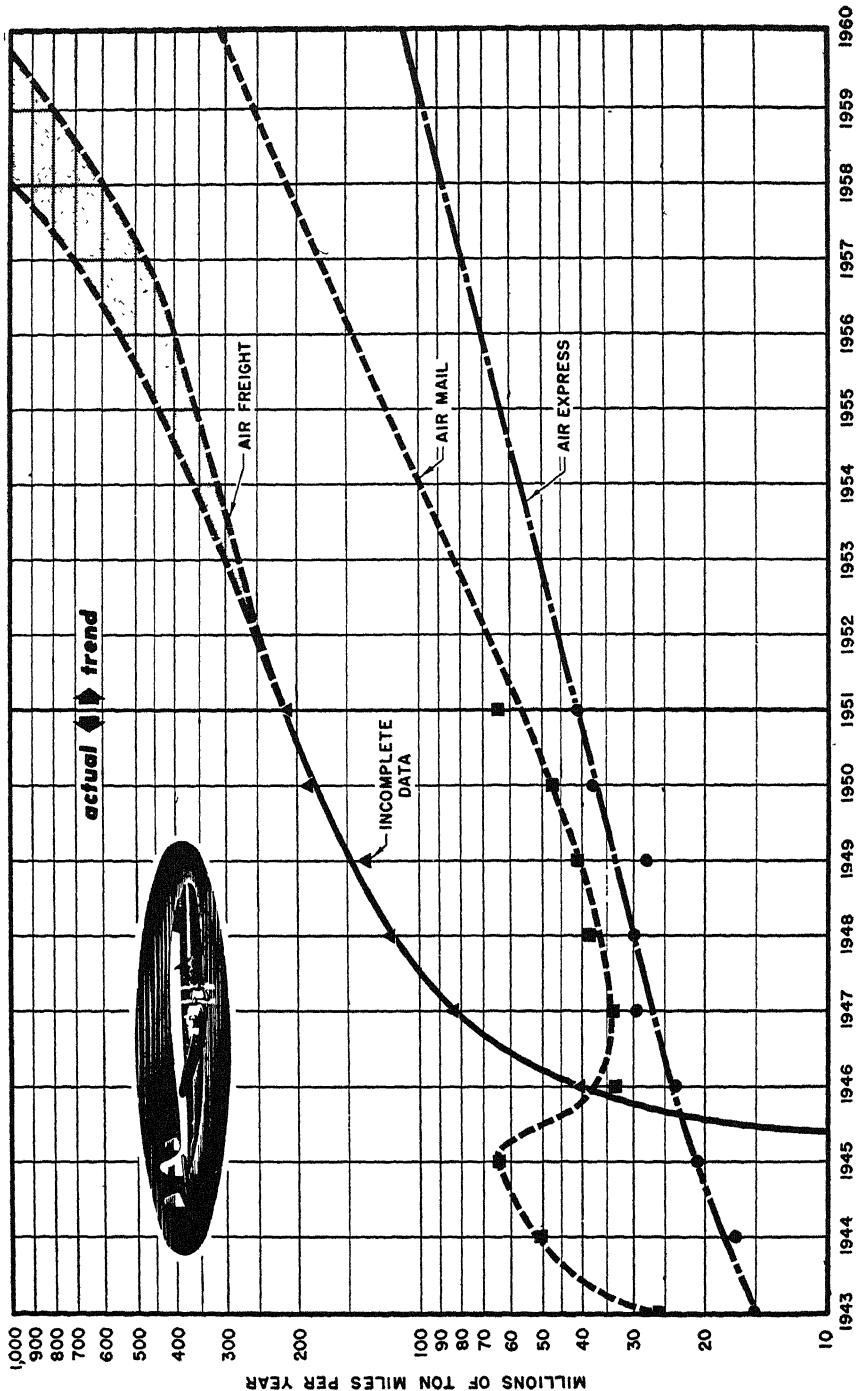
Several factors account for the wide divergence between early air freight forecasts and actual accomplishments. Probably the most important was the fact that the transportation of air freight was a new industry at the time when most of the predictions were made, and not enough data were available on which to base any reliable projection. Thus, in each case, the forecast largely reflected the optimism or pessimism with which an individual forecaster viewed the future and his own assumptions regarding the interaction of such factors as: (a) the amount of existing traffic which could be diverted from surface carriers; (b) the amount of new traffic which air shipment could generate; (c) the possible future of the nonscheduled air carriers; (d) the rate structure which air transport would be able to operate under; (e) the type of commodities which tended to profit most from air shipment.¹⁶

Many of the forecasters also overestimated the rapidity with which

¹⁴ Civil Aeronautics Administration, Staff Study, *Domestic Air Cargo Forecast 1955 & 1960* (Washington, D.C., 1952).

¹⁵ For examples of such streamlined sales efforts, see the following pamphlets published by American Airlines: "The Fourth Dimension in Apparel Merchandising," May, 1953; "The Fourth Dimension in the Distribution of Electronic Items," August, 1953; "Airfreight and Parcel Post, Combination Service," n.d. Much can be accomplished in selling air cargo if service is "geared to the needs of the customer." See John C. Emery, "Air Freight—New Potentials for Industry," *Harvard Business Review*, July–August, 1953.

¹⁶ Civil Aeronautics Administration, *Domestic Air Cargo Forecast 1955 & 1960*, above.



Courtesy: Lockheed Aircraft Corp.

FIG. 35. Trends and projections for domestic air freight (irregular air carriers not included after 1949).

air transportation would penetrate the assumed potential. For example, it was generally assumed that there would be a fairly rapid diversion of traffic from railway express, considered to be highly competitive with the air freight service. While railway express traffic has been the source of the largest part of air freight, this penetration has been much lower than was anticipated. Again, a large potential was estimated by certain forecasters in fresh fruit and vegetables, sea foods, and other perishables, but this potential has never fully been realized.¹⁷

It must be recognized in considering the volume of air freight that may move at any particular time that there will always be a certain proportion of the total property shipped by air that will be transported on a contract basis or in airplanes owned by shippers. It is also probable that contract carriers will continue to operate alongside common carriers and that these contract carriers will handle a substantial volume of freight.¹⁸

Abnormal economic conditions gave a considerable impetus to air freight movement in the postwar period, but actual experience has demonstrated that there is a real and continuing field for contract carriage in air transportation. Many shippers control sufficient quantity to pay them to hire a DC-3 or a DC-4 to take care of their entire traffic, or a shipper may have peculiar packing or in-transit requirements which make it advisable for him to have one special carrier do all his business because of special services a contract carrier will give him. Furthermore, the really large shippers who come to use air freight may well purchase their own aircraft and operate their own air transportation in much the same way that they have purchased trucks to meet their particular needs. The price of aircraft will certainly not be prohibitive for some volume shippers; and, if they have their own trucks to render pickup and delivery service, it can be

¹⁷ It has been held that a major factor contributing to the slow development of traffic volume in fresh produce was the tendency to neglect the marketing of airflown perishables. The airlines failed to realize the relationship between air cargo transportation and marketing. Apparently it was felt that rate reductions alone would generate a satisfactory volume of traffic, but this was not true unless the marketing problems inherent in perishable traffic were solved. See, Dwight L. Gentry, "Air Cargo Transportation and Marketing," *The Journal of Marketing*, July, 1952.

¹⁸ Carriage for contract had its origin in motor truck operation. It is an arrangement whereby the carrier transports goods under special and individual contracts with particular shippers. The equipment in which the transportation is performed is owned by the carrier and operated by personnel employed by him. The carrier is liable for the goods transported and also to the public for loss and damage arising from such an operation. See G. L. Wilson, *Motor Freight Transportation and Regulation* (Chicago: Traffic Service Corporation, 1937), p. 22.

expected that some of these shippers will enter air transportation for their own account.

It must, therefore, be realized that whatever the air freight potential may be, it will not all go by common carriers, a fact which seems to have escaped the attention of many of the applicants in the Air Freight Case. Probably common carriers will, in the future, haul no more than half the total amount of air freight that may move in the United States. Moreover, if we are to have any volume of such transportation at all, the potential, whatever it may be, can only be developed by an intensive promotional campaign and educational program to convince shippers of the advantages and economies of shipping by air.

It seems apparent that air freight will not for some time compete with surface agencies on a basis of rates alone. Shippers, however, will use air wherever its speed can produce values translatable into the price consumers are, or will be, willing to pay; they will also use air transportation if their total distribution costs can be reduced in an amount greater than the difference between air rates and those charged by surface carriers. Conceivably the shipper of any product able to fit into an airplane may, under certain conditions, find the speed of air transportation worth its extra cost.¹⁹

Air freight will, in many cases, offer shippers certain ways to reduce distribution or financing costs. Interest charges on the money invested in valuable articles while in transit will be lessened, as well as money invested in inventories of many types. In such cases, receivers may be willing to pay higher transportation costs to gain an advantage. Except in special instances, however, the importance of these factors becomes apparent only when the differential in speed is measured in weeks rather than in hours. For example, the differential in time for air express over rail express from New York to Los

¹⁹ The greatest asset of the air carrier in competition with surface carriers is, of course, its speed. As used in transportation, speed has a number of meanings, among them: (a) time per mile while in motion; (b) time between originating and terminating stations; (c) time between shipment and receipt; and (d) "constructive time" between shipment and receipt, or time which is commercially productive to shipper or receiver. It is obvious that the last named is the most significant concept in any discussion of speed as a marketable service. Time in motion, per se, is rather meaningless. For example, if a shipper sent out an order at 6:00 P.M. because his customer needed it at the opening of business at 9:00 the next morning, it matters little whether transit time is one or twelve hours. So long as the order is on hand at the time required, all the advantages of speed have been utilized. Similarly, the carrier which is faster in motion but is delayed at way-stops may take a longer time to cover the route than the slower carrier making a nonstop haul, and the carrier that neglects to deliver its cargo promptly from the terminal to the receiver may lose all its advantages in speed entirely. See Civil Aeronautics Administration, *Domestic Air Cargo* (Washington, D.C., 1948).

Angeles at the present time is three days, so that at 6 per cent the interest on this time saved would represent only five mills on a hundred-dollar shipment.

Savings in weight of packing and crating may also reduce the overall cost differential between air and surface transportation, when

TABLE 47
MARKETING-LIFE DAYS IN CHICAGO FOR CALIFORNIA
FRUITS AND VEGETABLES

COMMODITY	TRANSPORTED BY		
	Air	Rail Express	Rail Freight
Cherries.....	13	10	6
Apricots.....	9	6	2
Figs.....			
Broccoli.....			
Spinach.....			
Nectarines.....			
Cantaloupes.....			
Plums.....	11	8	4
Asparagus.....			
Strawberries.....	9	6	0

Source: CAA, *Domestic Air Cargo* (Washington, D.C., 1948), p. 8.

new packaging methods have been devised. Such a narrowing of the cost differential, however, is likely to be gradual, inasmuch as packing for air freight may require just as much strength as that for surface carriers, because of ground handling at both ends of the haul. The experience of the Army and Navy air transport services during World War II demonstrated that substantial packing economies are possible for almost all commodities flown. These economies for certain commodities reached 70 per cent of the total shipping weight, while the average reduction in shipping weight was reported as approximately 30 per cent. Any general improvements in packing would, of course, reduce expenses not only for air transportation but for other methods of transportation as well.

The possibilities of extending market areas arising from the speed of air transportation may also encourage its greater use. This factor has been particularly explored in the field of perishable commodities, because less time in transit permits products to remain in prime salable condition for a longer period after reaching distant markets. This is illustrated by Table 47.

Wider markets may well develop for such tropical and semi-

tropical perishables as mangoes and avocados, for fresh seafoods, for baby chicks and poults, and for other commodities now closely restricted to the localities of their supply. The most important development in this field has been in fresh cut flowers, the transportation of which has become a mainstay of the strictly air freight operators. Little has been accomplished as yet with fruits and vegetables of lower value.

The availability of air freight may make it unnecessary for a distributor to maintain any inventory at all for certain specialized products. Under such circumstances, savings and interest charges may become significant, but even more important probably will be the savings in warehouse space and the like.

Considerations for Air Freight Development

There has now been sufficient experience with air freight to indicate the basic considerations for its successful development. These may be summarized as follows:

1. Air freight will move in the quantity foreseeable in the future only over relatively long distances, probably 500 miles or more. At the higher rates which air carriers must charge, the airplane will not be able to compete with rail and motor transport on distances where such surface carriers can provide overnight service. It follows, therefore, that the short, high density passenger routes which have proven so profitable to the airlines, such as Boston-New York, New York-Washington, Chicago-St. Louis and the like will not be as profitable for air freight. The airplane reaches its maximum utility for freight on coast-to-coast and New York to Florida hauls, where its speed produces the important time savings which are its greatest contribution to efficient transportation.

2. There will always be a certain amount of seasonality in air freight transportation. Many, perhaps the majority, of the perishables which will move by air are what may be termed "ultraseasonal" in character, since it is the earliest crops, commanding the highest prices, that are likely to move. Such a crop as tomatoes, of course, may move the year round, but during the year they will be shipped to market from different places, as various crops ripen and are harvested in the varying producing regions. This creates the interesting situation that producing centers which require a high degree of regular, scheduled air transportation at the peaks of their producing seasons do not require any air transportation at all, or so little as to make

it unnecessary to render them service, during the remainder of the year. Consequently, any air freight operation must be flexible enough to utilize its equipment throughout the year, perhaps flying a variable pattern of routes and schedules as demand dictates.

3. There will probably be a directional unbalance of flow for air cargo for some time, despite efforts to equalize it by rate adjustments.

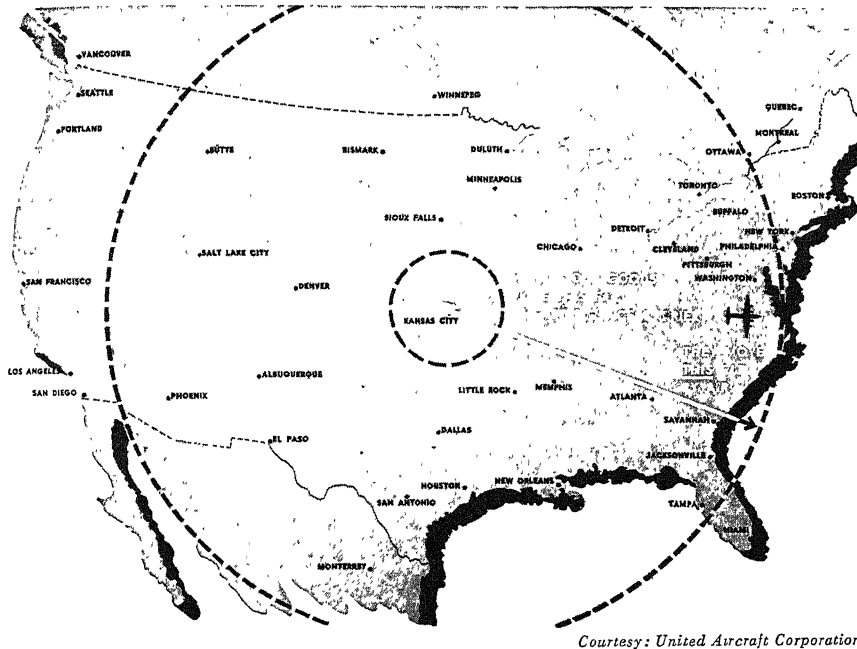


FIG. 36. Air cargo transportation broadens markets.

(See Chapter 9.) It has been found that westbound traffic exceeds eastbound traffic and that southbound traffic exceeds northbound. Unbalance in one direction is, however, nothing new, as it has long existed in the fields of rail, motor, and water transportation. Perishable air freight for example, has a one-directional flow in every instance.

4. If the airplane is to achieve its maximum usefulness as a freight transport—and upon its doing so depends the very existence of the specialized air freight carriers—it has to go where things are and take them where people are. (See Fig. 36.) The oysterman in Hampton, Long Island, or the vegetable grower in Salinas, California, is not always satisfied by being told that air service is available at New York or Los Angeles. Such shippers do not want a long truck or rail haul from dock or farm to airport. If perishable products are to fly,

they must fly immediately, not after hours being spent getting them to the point of departure. Also, if the air transportation available cannot provide single-plane service to ultimate markets, shippers of perishables are not interested at all. The delays, damage, and expense involved in transferring cargo from one airplane to another almost always will offset the advantages inherent in air transportation. This means that, if we are ever to have large-scale use of air transportation for perishable shipments, interchange of equipment between presently certificated cargo carriers is desirable.²⁰ A soundly conceived air freight system must, therefore, be radically different from a sound passenger system, because each must be planned to accomplish an entirely different type of service.

5. "Scheduled" service for air freight will for a long time mean something very different from scheduled passenger service. To the airline passenger, hours and minutes are important. The time of departure, the time in flight, the time of arrival at destination all guide him in his selection of carrier and particular flight. To the air freight shipper, on the other hand, "scheduled service" does not mean split-second timing; it means "regularity" and "dependability" of service. The shipper in Florida has no concern with the minute that a northbound freight plane departs or arrives. If he is promised "next morning delivery" in New York, Boston, or Chicago, he has little reason to care when the airplane departs or arrives just so long as the service is otherwise satisfactory. Where the airplane goes, what route it follows, or what stops it makes are of absolutely no concern to the shipper. This means that the air freight carriers have a flexibility in their operations and a margin for irregularity and schedule deviation that would not be possible were they transporting passengers.

6. No air freight carrier can as yet depend for livelihood on one or two types of traffic. It has been said that air transportation, in many of its characteristics, is akin to motor transportation and that, because it has been found that motor carriers may be sensibly and economically classified and restricted to the carriage of particular commodities, the same is true of the air carriers. This is not so; and, in the foreseeable future, air freight carriers must be permitted to carry a variety of traffic if their service is to be economically sound. This means that each freight carrier must have access to the sources and

²⁰ While equipment interchange is certainly desirable, most perishable traffic passes through central wholesale markets and the major markets are already served by each of the transcontinental and north-south certificated cargo carriers.

to the markets of the products and commodities which are most susceptible to air transportation.

7. Passenger routes sometimes furnish no clue whatsoever to the "community of interest" which might justify a freight route. This may well be one of the reasons why the airlines, certificated on a strictly passenger and mail basis, have found it so difficult at times to develop air freight business. For example, the *people* of Hartford, Connecticut, may have their greatest community of interest with New York City, and their greatest demand for transportation service may lie in that direction. Yet the *products* of Hartford may require transportation to factories in the midwest and on the west coast. So it is also with a fruit and vegetable producing area in California or Florida. The need of such an area for passenger air transportation to Detroit, Chicago, and New York may be virtually nil; yet those cities may represent the greatest markets for its produce.

8. Since air freight moves generally on long hauls and since the shipper, while he may be concerned with selecting the particular air carrier, is not interested in the routing to be followed, an air freight operator must be permitted a great deal of flexibility. The shipper of California peas or other perishables to the eastern market does not care whether his shipment reaches New York by way of Fort Worth, Kansas City, Denver, or a great circle course. Hence, an air freight operation should not be restricted to linear courses, defined by intermediate points, but should be authorized to fly between terminals over whatever airway or course offers the best flying conditions, just as do the airlines in their nonstop passenger operations between points like New York and Los Angeles. Flexibility in operations makes for economy and likewise permits greater regularity of service and prevents cancellations because of weather conditions. Conversely, rigidity of routing serves no useful purpose in air freight operations.

9. Air freight rates will eventually have to be made on the basis of a classification of some sort. (See Chapter 9.) Except for a very short time at the start of air freight transportation, commodity or group, rather than class, rates have been used by the airlines and other freight carriers. At least four factors will probably govern whether a commodity is placed in a high or low class for rate-making purposes. These are:

(a) *Density or Weight per Cubic Foot of Space Occupied.* Unlike other carriers, aircraft cannot be loaded safely above their rated capacity, nor can their capacity be increased in any way to meet

emergencies. Hanging loads are not possible in air transportation as they are for motor carriers, and trailer planes have not yet been developed. Therefore, since weight determines the carrying limitation of any airplane to a greater extent than is true of other means of transportation, it would seem logical that air freight should be classified with density or pounds per cubic foot as the chief governing factor.

Weight being the definite limitation on the amount of freight an airplane may carry, it can be seen that an airplane reaches its maximum operating efficiency when its area-cubic capacity is filled with shipments meeting the maximum weight capacity. Although there are many products that meet the requirements of both weight and area, the possibility of freight always being available to fill the area capacity and the weight capacity at the same time is unlikely.

Since rates are on a pound or ton-mile basis, it is more desirable for the carrier to attain the maximum weight capacity of an aircraft than it is to fill the cubic area. Air carriers are already figuring rates on the basis of a weight or measurement pound, whichever is the greatest, so as to reach the weight-carrying capacity from an income standpoint even though the area-carrying capacity is not fully utilized.²¹

(b) *Perishability*. The very essence of air transportation is speed, and perishable commodities have usually tended to use the most rapid means of transportation. Aside from the increased cost to an air carrier of handling perishables because of special services required, there is also a definite increase in the risk of loss and damage. If a carrier accepts a shipment, it guarantees perfect delivery if at all possible. If the perishability of a commodity is high, the risk is increased. This increased risk, with the added cost of special handling facilities, would have the definite effect of increasing the costs of transporting such commodities and should be considered in any classification.

(c) *Fragility*. Like perishability, breakability will surely characterize many shipments by air. A commodity may be considered fragile when special care in handling or special packing is required to avoid damage under normal conditions of air transportation. In fact, the packing or crating of any shipment plays a very important part in determining its fragility from the standpoint of the carrier.

²¹ The measurement weight of a plane can be determined by dividing the area-carrying capacity by the maximum weight limit. This will give the area that can be allotted to a unit such as, for example, a pound. Air carriers have defined a measurement-pound as equaling 400 cubic inches. Of course, as progress is made in aircraft design for cargo, this figure might well vary with the different types of planes used by the air carriers.

(d) *Value per Pound.* Value is very important in classification. The shipper of a high-priced or valuable article is much more able to pay a relatively high transportation cost than the shipper of a low-priced article. High-cost transportation is much more easily absorbed by a high-value commodity since the transportation cost is a proportionally lower part of its total cost than is the case for a low-value commodity. Therefore, any increase in price to cover the higher transportation costs has less effect on the market for a high-priced article than does a corresponding increase on a low-value commodity. Air carriers have already found it wise to require a declared value per pound above the base insurance value of all shipments, which proportionally increases the rate for more valuable shipments. This is because of the airline common carrier responsibility for loss and damage.

The number of items in an air freight classification should be kept as small as possible, and what is known as the analogous rule in ground transportation should be allowed to operate even more freely for the air carriers than it has for the others. This refers to the practice of placing articles with the same transportation characteristics into the same classes for rate making—for example, canned peas and canned pineapple or beer in glass bottles and ginger ale in glass bottles. In this way the classification will be kept relatively simple, and competitive items will automatically fall into the same categories. As an illustration, a very simple classification might make the following groupings on a volume-density basis rather than by commodities, as has been the usual practice with ground carriers:

<i>Weight per Cubic Foot</i>	<i>Class</i>
4-8 lbs.....	A
8-12 lbs.....	B
12-16 lbs.....	C
Over 16 lbs....	D

If such a classification were used, a simple measuring device could be attached to the scales on which shipments were weighed and the proper classification assigned automatically.

Chapter

17 * AIR FREIGHT HANDLING

THE airlines have found that problems involved in handling air freight are in many respects much more complicated than those encountered in handling passengers. This is due in part to the inanimate nature of all types of cargo, to the type of goods going by air, to marketing and sales conditions that help determine whether a shipper or receiver will use air transportation, to the costs involved not only in transporting freight through the air but in handling it on the ground, and to airport problems which are far different from those involving passengers.

The Pattern of Air Freight Traffic

When all property shipments by air were handled by express, the commodities then moving were those related to the speeding-up or functioning of industry rather than those for ultimate consumer use. But in 1945, when the airlines began to place some all-freight aircraft into operation, consumer goods began to be shipped by air in increasing quantities.

A shift toward consumer goods was natural as the base of air freight broadened. Consumer goods generally have lower density than producer goods. This is of extreme importance in considering the pattern, present and future, of air freight traffic. The limiting effect of the density factor on its development is obvious. According to a study by the United States Tariff Commission¹ only 3 per cent of commodities shipped in domestic freight have an average density of 6 pounds or less, only 18 per cent of 15 pounds or less, and only 27 per cent of 20 pounds or less. (Density means the weight of a commodity that can be put in a cubic foot of space.) Moreover, most of the lower-density items are concentrated in highly fabricated commodity groups—for example, in textiles and apparel products. By contrast, agricultural and fishery products, in which it is hoped that a

¹ See Civil Aeronautics Administration, *Domestic Air Cargo* (Washington, D.C., 1948).

substantial volume of air freight traffic will develop, have higher average densities than the average of all commodities studied by the Tariff Commission. Only 1 per cent of this group has an average density of 10 pounds or less, only 4 per cent of 15 pounds or less, and only 11 per cent of 20 pounds or less. Table 48 shows the effective

TABLE 48
CAPACITY OF CARGO AIRCRAFT AND RAILROAD CARS

Carrier	Number of Cubic Feet	Weight-Carrying Ability in Pounds for 675 Miles	Effective Density (Lbs. per Cu. Ft.)
DC-3 (Willis).....	1,223	7,500	6.3
DC-4 (United).....	3,310	17,129	5.2
C-46 (Slick).....	2,554	11,220	4.3
DC-6A (Slick).....	5,000	30,000	7.0
Express rail car.....	5,320	100,000	18.7
Refrigeration car.....	2,260	60,000	26.5
Rail boxcar.....	3,713	100,000	26.9

Source: CAA, *Domestic Air Cargo* (Washington, D.C., 1948), and Douglas Aircraft Co., Inc.

density of cargo aircraft as compared with railroad cars.

The growth of all-cargo operations since the close of World War II compelled increasing attention from the carriers to the density problem. The nonscheduled carriers, faced with the necessity of obtaining higher pay loads for their aircraft devoted exclusively to freight, specialized in the development of traffic in apparel, dry goods, cut flowers, leather products, sea foods, and meats. All these products fell within commodity groups with relatively lower density than the machinery, electrical appliances, and vehicle parts, the most important commodity groups from which the certificated carriers drew their freight traffic. Concentration on low-density items, particularly when coupled with high value, appears to be the path that promotional activity in air freight should take as offering the best possibility for steady development.

It should be borne in mind, however, that, while low-density items offer good prospects for air freight, their carriage involves extra handling costs as a rule and, when lower than the effective density of any particular airplane, means unused weight capacity. This accentuates the problem of obtaining a proper "mix" of commodities in air freight traffic for maximum efficient operation, as well as the need for radical changes in equipment design, which might substantially increase effective density.

The present pattern of air freight traffic indicates that a full payload of consumer goods is more valuable to the carrier than a full payload of producer goods. Promotional activity in the consumer goods field was stimulated by inauguration of all-cargo operations, which compelled consideration of the value of a full payload of commod-

TABLE 49
PROBABLE COMMODITY GROUP DISTRIBUTION
OF AIR FREIGHT

Commodity Group	Per Cent of Enplaned Freight
Food and kindred products (processed).....	6.2
Tobacco (processed).....	3.6
Textile-mill products.....	18.0
Apparel.....	27.6
Lumber and timber.....	.3
Furniture and finished lumber.....	.6
Paper and allied products.....	.4
Printing, publishing, and allied products.....	1.7
Chemicals and allied products.....	2.2
Petroleum and coal products.....	.4
Rubber products.....	.8
Leather and leather products.....	2.7
Stone, clay, and glass products.....	.3
Iron and steel products.....	2.2
Nonferrous metals and products.....	5.4
Electrical machinery.....	2.7
Machinery (except electrical).....	5.5
Automobiles and equipment.....	4.5
Transportation equipment (except automobiles).....	1.5
Miscellaneous industry products.....	5.5
Metals (selected).....	1.8
Agricultural products.....	4.9
Imports (selected).....	1.2

ities as distinct from the value of commodities in a given cubic foot of space.

The Civil Aeronautics Administration has examined those basic attributes of commodities which are most relevant to measurement of their air freight potentialities. Two of these, density and price, were found to be basic commodity classification criteria for this purpose. Density and price together measure the relative value which can be put into a given amount of space. Applying their air freight susceptibility ratings to various commodity groups established by the Bureau of the Census and other governmental agencies, the CAA estimated that, during the next few years, i.e., the developmental period of air freight, the percentage of enplaned cargo attributable to each would be as shown in Table 49.

There are, of course, differences within commodities in each of these groups, and these differences modify the classification which is based primarily on density and price. Some of these differences are: (a) geographic concentration of source of supply, (b) the average distance hauled as a measurement of the market area, (c) perishability or seasonality, and (d) gross margins as a measurement of the extent to which a commodity may absorb relatively high rates.

Packing for Air Freight and Express

One of the principal economies claimed for shippers in their use of air freight is that savings will be made in packing costs. Such savings, it is often stated, tend to offset the higher rates of air transportation. There are certain savings in packing costs when goods go by air, and these would be greater were it not for the fact that nearly every air shipment has to use a ground carrier at either end of the journey.² Many air express shipments go part of the way by rail because they are destined to off-airline points; all air express and all air freight, with some very few exceptions in the perishables field, are moved to and from airports by truck. This means that containers have to be stronger and heavier than they might otherwise be for the air journey alone.

The Railway Express Agency applies only the general rule to air express that "all property shall be so prepared or packed as to insure safe transportation with ordinary care and handling." The airlines specify the following packing and marking requirements in their Official Air Freight Rules Tariff:

(a) Shipments must be so prepared or packed as to insure safe transportation with ordinary care in handling.

(b) Any article susceptible to damage by ordinary handling must be adequately protected by proper packing and must be marked or bear appropriate labels.

(c) Any article susceptible of damage as a result of any condition which may be encountered in air transportation, such as high or low temperatures,

² A florist in Philadelphia said: "We simply put the flowers in boxes with a little ice which arrive in much better condition. Economy in packaging results from this type of shipment, compared with rail express which has to be packed in ice in boxes and braced against slipping." By use of air freight a florist saves from 7 to 10 pounds of ice in the packing of a 45- to 50-pound box. Again, a firm in Ohio shipping electric motors for phonographs to New England stated: "Shipping costs no more than Railway Express because no crating has to be done." The traffic manager of a western aircraft manufacturer said: "Some saving is experienced in the lighter crating and packaging of spare parts, and even on the motors and propellers. On the motors we estimate that the saving in crating weight is about 65 pounds each." See John H. Frederick, "Packing for Motair Cargo," *Distribution Age*, October, 1949; M. R. Baruh, "Air Freight Packaging," a paper presented at the California Air Freight Clinic, August 19, 1950.

high or low atmospheric pressures, or sudden changes in either, must be adequately protected by proper packing and any other necessary measures.

(d) Each piece must be legibly and durably marked with the name and address of the consignor and consignee.

(e) Pieces with a floor-bearing weight in excess of 100 pounds per square foot must be provided with a skid or base, suitable for use in available aircraft, which will reduce the floor-bearing weight to 100 pounds or less per square foot. Such skids or base must be furnished by the consignor and included in the gross weight of the piece.

(f) Magnetic material will be accepted only when marked "Magnetic Material."

It will be noted that several of the above packing requirements result from the peculiar characteristics of the airplane as a cargo carrier. Shippers have to bear in mind the effects of low temperature and reduced pressure in case the aircraft goes to high altitudes. Cut flowers, fresh vegetables, and certain liquids might then be in danger of freezing unless properly protected. Low pressures, on the other hand, may start leaks in some containers, which makes friction-top cans containing chemicals or liquids vulnerable to high altitudes. The floor of an airplane is not very strong; and so the density of individual packages is an important factor, which accounts for the rule for reducing floor-bearing weight to 100 pounds or less per square foot. This stipulation is not as restrictive as it might seem because a relatively small box with a base of 27×16 inches occupies a floor space of 432 square inches, or 3 square feet. This box could, therefore, have a load of 300 pounds without exceeding the 100-pound limit.

Because the airlines carry a considerable proportion of air freight in combination aircraft with comparatively small doors or other openings for loading and unloading, they provide that "pieces of unusual shape, or weighing in excess of 200 pounds, or more than 20 by 24 by 44 inches, or whose combined length and girth exceed 132 inches, will be accepted only by advance arrangement." It is also provided that shipments requiring special devices for safe handling will be accepted only when such special devices are provided and operated at the risk of consignor or consignee, and that shipments requiring special attention, protection, or care en route will be accepted only upon advance arrangement. The rule about marking magnetic material is because shipments are stowed as far as possible from the airplane's navigational instruments so as not to affect their accuracy.

Every now and then someone attempts to generalize on packing costs, comparing air with other forms of transportation. But unless these comparisons are based on the results obtained by actual experi-

ments with specific shipments, the information is likely to be inconclusive or somewhat misleading. It is impossible to say with any accuracy that freight of a certain character, packed for shipment by rail or motor carrier, will, under all conditions, weigh a given amount more per unit or that the packing for ground carrier movement costs a definite amount per hundred pounds more or less than the same product packed for air transportation.

In some cases, goods can be shipped by air without any packing at all, if suitable pickup and delivery trucking arrangements are made at the journey's start and end. In such cases, it follows that large savings can be made from the absence of packing costs and charges for excess shipping weights. Such situations are, however, the exception rather than the rule and apply generally only to full-plane shipments.

There is comparatively little air freight moving in full planeloads. The majority of air shipments weigh less than 200 pounds each, and few shipments exceed 500 pounds. This means that air freight traffic is loaded and mingled with other shipments, with baggage, and often with mail. It is therefore subject to all the stresses and strains incident to loading and unloading and handling at transfer points. It is also subject to a certain amount of damage from the weather, since no airport is yet adequately supplied with warehouse space for air freight sorting and holding until picked up by consignee or loaded at originating point. There is also the danger of loss from pilferage, which is sometimes increased by the lack of packing or by light, easily opened containers.

Under present air freight handling conditions, such shipments should be packed just as securely as if they were going by rail or motor carrier. In fact, as air freight traffic increases in volume, in distances hauled, and in the number of transfers between connecting carriers, packing requirements will certainly get closer and closer to those which experience has shown are desirable for shipment by ground carriers. But *secure* packing does not necessarily mean *heavy* packing, because lightweight containers, such as the corrugated box, have decided advantages.

Air freight rates are high as compared to those for ground transportation, and so it is to the shipper's advantage not to pay for any more weight in his containers than necessary. Most air freight is still loaded and unloaded from aircraft and trucks by hand, and here the lightweight container has a decided advantage in overcoming the natural inclination of all cargo handlers to "let gravity do the work." Bearing lightness in mind, therefore, standards of air freight packing are

not very different from any others; and the practices of good packing, which have been in force for years on other carriers, all apply to air transportation.

Security for Air Freight

Up until very recently, air carriers have had a splendid record for low loss and damage to shipments. For example, one airline over quite a period of time paid claims for damage and loss running less than 1.5 per cent of total freight revenues. More recently, however, claims for loss and damage of air cargo have increased. Air freight and express may still be side-line business for most airlines (in 1952, it accounted for only 5.2 per cent of the operating revenues of the certificated carriers), but where claims paid on single shipments run sometimes to several thousand dollars, the problem of greater security for air cargo becomes important whether volume or earnings from this source are large or small.

Adequate security for air freight must be considered in the light of (a) pickup and delivery service, (b) handling on the ground at airports, (c) stowage in aircraft, and (d) the air haul.

As will be explained later in this chapter, the pickup and delivery services for most air carriers are conducted in the various cities by independent truck operators under contractual arrangements with individual carriers or through Air Cargo, Inc. Security for shipments is equal to that for any motor freight movement. The ground haul at each end of the air haul is, therefore, not directly under the supervision of the air carriers. Air freight is picked up with other freight, is very often mixed with it in the local cartage operations, and is sorted at a downtown truck terminal before being taken to the airport. This means that it is handled no differently from other motor freight and should be packed as securely as any shipment going all the way by truck.

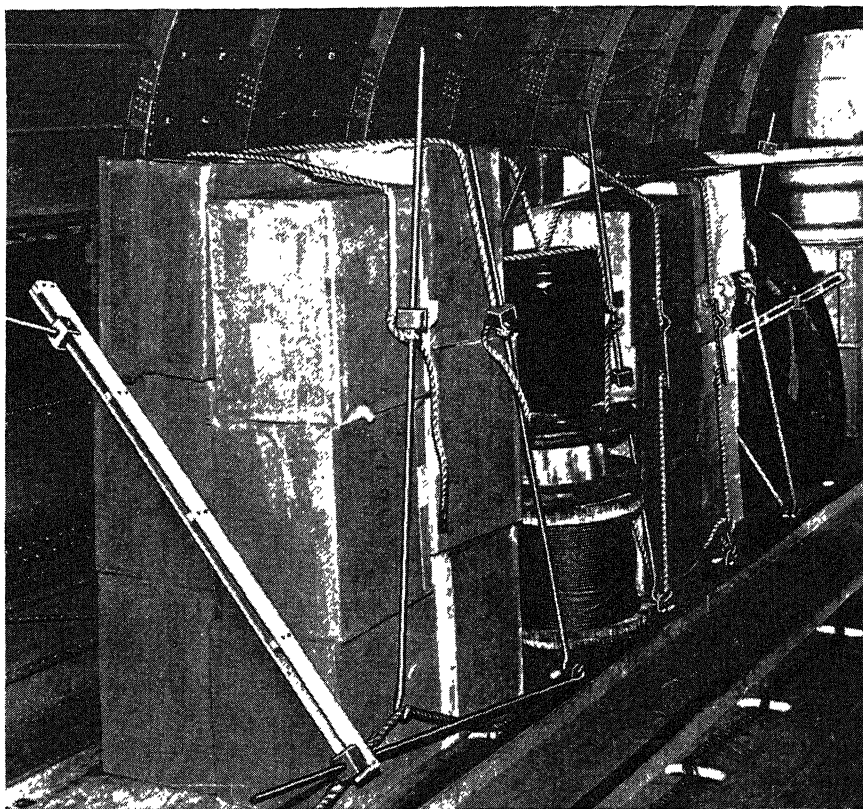
After an airplane is in the air, its cargo gets the benefit of the smoothest means of transportation available. Because of this, air freight salesmen have been able to promote the transportation of certain commodities with minimum crating and minimum packaging. Too often, however, sufficient attention has not been given to the ground-handling problem to and from the airports and at the airports themselves, where 95 per cent of the loss and damage sustained by air freight is experienced. In other words, ground-handling facilities and procedures have not kept pace with the rather optimistic packing sales talks.

It has, of course, been realized that freight-handling facilities are in many respects still only equal to those of the dark ages—lift, lug and load, unload, lug and leave; in other words, manpower. In spite of a few improvements, ground handling and aircraft loading depend almost entirely on the physical strength and dexterity of the men in the various stowing or ramp crews. Greater mechanization of airport freight handling is an absolute necessity for greater security.

The airlines have been remiss in some aspects of employee training in the freight-handling side of this business. Even with the fullest use of mechanical devices, there is still the necessity for personnel training and discipline leading to careful freight handling if the light-packing sales argument is still to hold. It should be drummed into handling personnel day after day that they have an important part in building and holding volume, that air freight security is their responsibility as much as it is that of anyone else.

Problems of air freight and express stowage have received much study, particularly from the standpoint of making the greatest use of the available space so that a given aircraft will carry the maximum load and obtain the greatest possible revenue for a given trip. Considerable study has also been given the problem of stowage, so as to protect aircraft from damage, through devising methods of tie-down. Because an airplane climbs and glides down, banks and turns, drops into air pockets, and rises over invisible bumps, something much better than the usual band iron or dunnage familiar to rail shippers is needed. A sharp downdraft, for example, can lift an entire cargo off the deck of an airplane, and the resultant upward strain may be as much as a couple of times greater than the weight of the cargo.

Less study has been given to the problem of protecting the cargo itself from damage it may receive through the tie-down methods used to eliminate slack and protect the aircraft. Ordinary ropes, pulled as tightly as possible, are still used; and their effect on the packages on the edge of piles is obvious. Rods, beams, locks, and jacks comprising various "skyloader" methods are also still used more effectively than ropes but still not without some danger to lightly packed cargo. (See Fig. 37.) In all-cargo aircraft and in some cargo compartments of combination aircraft, built-in or strap bins are used, offering more security to individual shipments than either of the other methods. (See Fig. 38.) Future tie-down facilities will probably take the form of a net or "covering" type of equipment, plus the simple single tie-down unit, such as a single web strap or cable and hook with toggle arrangement for taking care of the unusual or extremely heavy pieces



Courtesy: Evans Products Co.

FIG. 37. Use of the Evans "Skyloader" tie-down device.

which require separate and individual tie-downs. Considerable experimenting has been done with preloaded containers for cargo aircraft and with the use of pallets. Some in the industry think these latter methods will answer many of the security problems.

There is also the problem of stowing freight so that one type of shipment will not injure another, as would happen if heavy shipments were piled on fragile materials, if shipments were scraped against projections or against each other, and the like. An amusing but costly experience of one cargo carrier illustrates a careless type of stowage which could have been avoided. It seems that an ostrich, a live one, was being shipped properly crated to avoid kicking but with its head outside. The ostrich was placed next to a pile of light containers of orchids on departure from San Francisco. By the time Kansas City was reached and the load was inspected, the ostrich had lunched off over \$500 worth of orchids! (Probably the most expensive meal ever served in the air.)



Courtesy: American Airlines

FIG. 38. Cargo bins are favored by airlines where mixed freight and mail loads are carried.

Security in the air haul is a part of stowage as just mentioned, but it is also part of the whole problem of air safety. There have been a few strictly air-cargo aircraft lost, but every combination airplane that meets disaster also carries cargo. This problem is, of course, receiving the greatest attention of any, both by the carriers and by the government, as has been discussed in Chapter 11. Despite improvements, there will probably always be some air accidents, since, as has been said before, lack of safety is the price paid for motion. But these are calculated risks in all transportation. It is the avoidable risks to

air freight security which must receive immediate attention if the air carriers maintain the loss and damage record for which they have previously been noted.

Air Freight Insurance

The airbill, corresponding to the bill of lading used in other forms of transportation, now issued by all certificated airlines to shippers, contains no detailed statement of the liability of the carriers for freight beyond a reference to its value and condition at time of shipping. The Air Freight Rules Tariff, concurred in by all certificated airlines, is the basic document by which air carriers list liabilities accepted or rejected.

The Air Freight Rules Tariff also contains provisions placing responsibility on the shipper for such matters as proper packaging and marking and for the declaration of proper value to the carrier if he is uninsured and therefore wishes to collect from the carrier in the event of loss and/or damage.

Under normal circumstances, an airline's liability for loss and/or damage is limited to \$50.00 per shipment or, if the weight of the shipment exceeds 100 pounds, to 50 cents per pound. If the shipment is more highly valued, it is the uninsured shipper's responsibility to make declaration of such value, which, on general cargo, may be done at an additional cost of 10 cents per \$100.00. Various airlines have exceptions to this, generally applying to perishables and live animals. These exceptions usually restrict the liability of those carriers who have taken the exceptions to \$10.00 per shipment or 10 cents per pound, whichever is the greater. In order to declare a higher value, it is necessary for the shipper to pay, in some instances, \$2.00 per \$100.00 of value and, in other instances, up to \$5.00 per \$100.00 of value, depending on the individual airline requirements.

Under the Air Freight Rules Tariff, declaration of value by a shipper implies liability of the airline up to that value, except where denied by a somewhat amplified statement of the usual carrier's exclusions of liability, since air carriers, unlike other carriers, may legally contract away all liability except for culpable negligence. The following exclusions as to airline liability are in effect for all certificated carriers:

1. Acts of God, public enemy, public authorities, strikes, riots and civil commotions, quarantine, war.
2. Perils of the air.

3. Act or default of consignor, consignee, or owner.
4. Defect or inherent vice of the shipment.
5. Authority of law.
6. Violations of any of the rules contained in the Air Freight Rules Tariff and supplements thereto by a party claiming an interest in the shipment.
7. Acts or omissions of warehousemen, customs and quarantine officials, or other persons gaining lawful or unlawful possession of the shipment.
8. Delay.

There is also a limitation in section 403 (b) of the Civil Aeronautics Act further limiting airline liability. This section prohibits rebates, and under it airlines are powerless to provide settlement of a claim not permitted under their Air Freight Rules Tariff. Carriers violating this provision are subject to penalty of a fine up to \$5,000 for each violation thereof.

It is true, of course, that the exclusions of liability listed above are subject to legal contest; and, as has been the case with other types of carriers, legal decisions may in the future prove that liabilities now denied by the air carriers must be accepted. For example, when one considers the legal history of disputes over just what constitutes "perils of the sea" in ocean transportation, it would seem that the exclusions of "perils of the air" by an air carrier are ones lending themselves immediately to factual dispute. Again, the term "delay" is rather broad, and the carriers' rule makes no qualification as to whether it refers to physical loss or damage to perishable cargo caused by delay or whether it refers to such other loss as loss of market.

Shippers interested in protection beyond the Air Freight Rules Tariff provisions are, of course, free to arrange for coverage to whatever degree desired through an insurance company. This type of coverage usually takes the form of "transit insurance." "Transit insurance" is a general category in the insurance business but usually refers to coverages that indemnify the shipper or owner of property for losses that may occur while his property is being carried from one point to another by a carrier and is, therefore, not under the control of the owner. In addition to providing indemnity for losses which an uninsured shipper might collect from the carrier, such insurance in broad terms (a) indemnifies the assured for losses for which the carrier is not liable, (b) indemnifies the assured for losses in excess of

the liability of the carrier, and (c) usually makes it possible for the assured to obtain more prompt payment of loss from his insurance company and be relieved of the burden of collecting from the carrier.

Insurance indemnifies the shipper for those losses which occur despite precautions taken by himself and the carrier. It places him again in his original financial position before the destruction of or damage to the property shipped. In the sense of minimum protection, insurance finds its place in filling the breach created by the reasonable waiver of liability of the carrier for acts of God, perils of the air, and the other fortuitous occurrences mentioned previously. Broader protection, including what is termed "all-risk coverage," is available and is in fact the coverage provided in most cases.

Directly following World War II, insurance companies extended their policies to cover air freight in broader terms than those now in effect; and owing to their lack of knowledge of the perils of air transportation and the susceptibilities of cargoes shipped by air, plus the inefficiency and lack of dependability of some of the noncertificated carriers, heavy losses were suffered by these underwriters. Time and the constructive efforts of those involved in shipping and transporting by air have lessened most of the early problems, but the mark left on the insurance companies' experience unfortunately still has its effect on rates and the availability of coverage. The major transit insurance underwriters in the American insurance market are, however, studying air cargo insurance; and, in due course, types of coverage should emerge from the somewhat experimental stage in which this type of insurance now finds itself.³

Air Freight Pickup and Delivery

When the airlines started to carry a volume of air freight, as distinct from air express, the problem arose as to how air and ground transportation was to be co-ordinated, because every airline haul became a ground carrier haul at either end of the journey. In other words, how was the pickup and delivery function to be performed? The airlines at first quoted all rates on an airport-to-airport basis on the theory that shippers would bring out their freight and consignees would call for it at the other end. It soon became apparent, however, that this was a dangerous policy, because shippers were slow to bring freight to the airports and consignees were inclined to take their own time about calling for it. Much of the speed of air transportation was

³ See Charles S. Rhyne, "Liability Problems of Air Cargo Carriage," *Law and Contemporary Problems*, Winter, 1950.

lost because shipments were delayed at airports when they might have been delivered had facilities been available, and some users began to wonder if air transportation was worth what it cost.

The question was, therefore, whether the airlines should individually or collectively go into the trucking business to supply pickup and delivery or whether they should jointly contract with already existing motor carriers. Fortunately, an airline co-ordinating agency was already in existence, Air Cargo, Inc., which had been formed as a research organization, had practically died out, except for the name, during the war, but was now at hand with an excellent name, ready-made to fit the airlines' need of the moment.

The airlines, after much discussion and a number of attempts on the part of individual companies to provide the needed ground service themselves, decided in favor of contract operations on a nationwide basis. In reaching this conclusion, a number of factors were regarded as determinative: (*a*) Providing the service by contract, rather than directly, would permit rapid establishment of the program on a nationwide basis, with the opportunity always present to establish direct operation at any point where a contractual arrangement did not work out or was more costly. (*b*) Establishing a direct operation with the airline agency owning the trucks would involve the outlay of too much money, considering the financial condition of the air carriers. (*c*) The volume of air freight except at the largest airline points appeared to be insufficient to permit a sound and economical cartage operation for pickup and delivery of this traffic alone, whereas such a service could easily be integrated into the operations of many local motor truck operators. (*d*) The problem of obtaining local licenses and certificates to engage in trucking operations was avoided in those jurisdictions where intrastate shipments of air freight were involved. (*e*) Proceeding initially on a contractual, rather than a direct, basis would afford the airline agency—Air Cargo, Inc.—an opportunity to acquire information and experience on pickup and delivery which would be very valuable in forming later plans for a direct operation at points where such a service appeared warranted.

The first step was to draft a standard-form pickup and delivery contract. This was done by Air Cargo, Inc., in co-operation with the Executive Committee of the American Trucking Associations. The advantages of such a uniform contract are many: liability of the contractor, insurance coverage, services to be performed, accounting procedures, handling of C.O.D shipments, and numerous other items

would be identical at all airline points. Thus an airline responsible for an interline shipment would have assurance that the delivery service, the insurance protection, and the accounting procedure for that shipment at destination would conform to those performed at points on its own line.

The standard-form service contract was an agreement between the local truck operator and Air Cargo, Inc., acting as agent for and on behalf of the airlines serving the particular point at which the contract was negotiated. Under these contracts, motor truck operators agreed to provide, among other things, pickup and delivery service, storage facilities, a city air freight terminal when requested by the airlines, and the issuance and execution of all necessary shipping documents. Special provision was made for the insurance of air freight in possession of the truck operator. Air Cargo, Inc., agreed, in consideration of a nominal reduction in the compensation otherwise due the contractor, to indemnify him against and all liability arising from the loss of or damage to air freight while in the possession of the contractor. As a result of this contract, nationwide uniformity was obtained in the insurance protection for air freight while in the possession of trucking contractors, at a rate far below that which the majority of individual contractors would be able to obtain. The shipping public benefits by this program because the lower cost of insurance means not only lower rates but also a uniformity of responsibility and handling in the event of loss or damage; the air carriers benefit because loss or damage of air freight while it is in the possession of the trucking operators is now removed from the experience records of the airlines, thereby lowering their insurance premiums; and the truckers benefit because they obtain substantially greater insurance protection at a lower cost than would otherwise be possible.

The creation of a nationwide pickup and delivery service using independent local truckers at each airline point presented numerous problems, however. The major objective of the airlines was to obtain uniformity of ground service, and the uniform contract helped greatly toward this end; but the fact remained that Air Cargo, Inc., and the airlines could not possibly exercise the same degree of control over operations provided by independent contractors that would be possible if Air Cargo, Inc., operated its own trucks. Further difficulties arose from the fact that there was considerable variation in local conditions, including the volume of traffic and the size and type of truck operators available. In order to create as much uniformity as

possible, despite varying local conditions, Air Cargo, Inc., set up local cartage committees composed in each instance of local airline representatives to assist in negotiating and supervising local ground service. This has resulted in Air Cargo, Inc., utilizing the services of virtually every size and type of trucking operator, ranging from the large over-the-road motor freight operators, with a large fleet of both highway and city pickup and delivery trucks, to the owner-operator with only a single truck.

Truck operators involved in co-ordinating air and ground transportation fall within three classes, as follows:

1. Motor carriers engaged in general hauling activities where their air freight pickup and delivery are only a small part of their total business. Ordinarily, they have a fleet of vehicles considerably in excess of the demands of the air traffic, although they sometimes assign certain trucks exclusively to that work. In addition, the general nature of their business requires that these large truck operators maintain a city terminal which is available for the delivery and acceptance of air freight along with their other traffic. In cities of considerable geographic extent but relatively low air-freight-generating capacity, truckers of this type appear to be the most appropriately organized and equipped to provide the type of service required by air carriers. The fact that they are engaged in a general cartage business permits certain of the air freight services to be integrated with their other activities, thereby reducing the unit cost to the airlines; and the fact that they operate extensive fleets of vehicles permits a rapid and effective coverage of a large geographic area.

2. Truck operators confining their activities to surface transportation for all types of air traffic. Some of these operators provide transportation for passengers and mail as well as air freight. They are well fitted for pickup and delivery operations in cities which are not extensive in area or which generate but little traffic. The fact that regularly scheduled trips must be made between an airport and the city in the course of the regular passenger and mail service enables these operators to provide air freight pickup and delivery at a very reasonable cost. This explains why a trucker in this class is at some cities the only motor carrier available and is prepared to quote a reasonable rate for the service required by the airlines.

3. Motor carriers working exclusively under a contract with Air Cargo, Inc. There are not many of these, and usually such an operator

owns and operates his own truck. This is really an ideal situation from the point of view of airline supervision; but since pickup and delivery of air freight provides the sole source of revenue for the exclusive operator, there are not many places where the rates that can be collected from shippers will provide a fair return. The volume of traffic to be handled and the length of the average trip are important considerations in determining whether such an operator may earn a reasonable return without a subsidy being paid by the airlines or without the service to the public being reduced below the standard which Air Cargo, Inc., is trying to maintain.

The opportunity of selecting the type of motor carrier whose size and character of operation are most ideally suited to the particular type of service pattern required at each individual airline point has been an important factor in attaining uniformity in the quality of the pickup and delivery service provided under the uniform contract. Substantial variation in the types of motor carriers selected imposes a somewhat greater supervisory burden on Air Cargo, Inc., than would be the case if all the truckers were in the same category, because each type of operator has his own peculiar problems and cost considerations. The additional burden, however, is probably more than offset by the benefits to the over-all service resulting from this flexibility in selection.

Almost without exception, the services provided by the contracting truck operators under the standard service contract are considerably greater than of those which were previously provided for individual airlines. By concentrating the total volume of air freight at a particular point in the hands of one trucker, a substantially more effective and more frequent scheduling of trips to and from the airport is made possible. Where previously the general rule was one trip daily for the individual airlines, most truck operators make two, and frequently more, scheduled round trips; and, in addition, there are special trips, provided for at many points, made at any time of day or night at the request of shipper or consignee. Many truckers also provide city terminals where shippers may leave air freight or consignees pick it up.

Airport Handling of Air Freight

Air freight handling at airports is still a more or less makeshift matter. There are several reasons for this. For one thing, although special air-cargo aircraft have been developed, their use has been largely confined to the military. Hence the so-called all-cargo airplanes flown by the airlines and other operators are mostly passenger

types not really designed to carry freight.⁴ The result is that the aircraft now in use are far from standardized; and their use has been handicapped because of the lack of multiple loading doors, limitations on full-end loading, nonrectangular cargo compartments, the shape and noncompartmentalization of the fuselage, and lack of synchronization between the plane-bed level and that of the truck bed. A further difficulty is that airport operators and air carriers are still uncertain about what the air freight will amount to, both as to nature and as to volume.

Another aspect of the problem is the fact that air cargo, using the term in its broadest sense, arrives at the airport by various means. Air freight is brought in by the truckers operating under contract with Air Cargo, Inc., as well as in the trucks of individual shippers. Air express comes in the trucks of the Railway Express Agency. Mail comes in the post office trucks. Passenger baggage, still regarded in the air cargo category by most airlines, comes by the various means with which everyone is familiar. Company material shipments originate at the airport but arrive at the loading point on the usual airline carts. A considerable amount of co-ordination is necessary, therefore, particularly since most air cargo is now carried with passengers in combination aircraft. This will probably be the case for some time to come.

One handling problem concerns the picking-up of the various types of air cargo destined to go on a particular flight. Freight can be assembled in one place; but, in the case of transfer from one airline to another, a pickup problem on the airport is created. Express may be placed with freight at the airport; but so far the Railway Express Agency has not favored this, since they feel their traffic is entitled to flight priority, at least in theory, and should be handled separately to avoid re-sortings. Air mail, which now includes fairly heavy parcel post shipments, must be separated from freight and express because of the security involved and the regulations of the Post Office Department. Baggage, which still creates a big problem with the continued use of combination aircraft, is assembled at still another place. To get

⁴ These planes are: the Douglas C-47, which is the well-known 21-passenger DC-3 twin-engine airplane converted to cargo operation by removing its passenger cabin interior and installing a large door at the rear end of the cabin for ease of loading and unloading; the Douglas C-54, which was originally designed as the DC-4, a four-engine 50-passenger transport converted during the war as a military freight carrier by also removing the passenger cabin interior and substituting a large cargo door for the standard passenger door; and the Curtiss-Wright C-46, primarily designed as a 37-passenger transport just before the war, converted by the military during the war as a cargo carrier, and used since for that purpose commercially.



Courtesy: United Air Lines

FIG. 39. Use of the truck in handling freight on the airport.

all this cargo together without delay for a given flight is still an unsolved problem at many airports and involves the use of many different kinds of ground-handling equipment.

The airlines are beginning to realize that it is the ground time and costs of ground handling and loading that threaten to retard development of the vast unexploited air freight potential. In many instances, cost of handling air freight from the consignor into the aircraft and from the aircraft to the consignee approaches the actual expense of the air haul itself. This condition is also true of the time element.⁵ While it is recognized that one of the principal selling advantages of air cargo is speed, it is not uncommon to have the time during which the freight is on the ground in pickup and delivery, waybilling and manifesting, and loading and unloading exceed the time that it is in

⁵ R. Dixon Speas, former Assistant to the President of American Airlines, points out that in 1950 for a New York-Detroit trip, ground handling took 85 per cent of the total time the shipment was in transit from shipper to consignee and that, for the slightly longer flight to Chicago, this figure decreased only a little to 81 per cent and that, even for the long haul from New York to Los Angeles, ground time used 42 per cent of

the air. This unfortunate situation excludes a large segment of air freight of the so-called short haul (500 to 750 miles) potential. While there is now some freight carried on the short haul, it is a very small part of the available potential which can be developed if and when the time comes that a shipper's freight is handled in the proper ratio of in-transit time—ground to air.

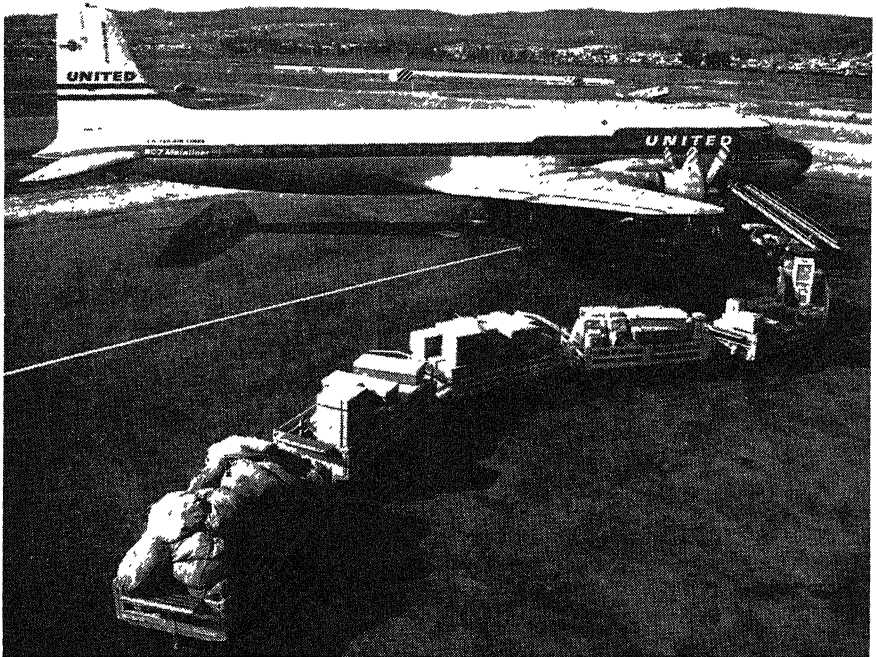
The various methods of airport freight handling are as follows:

Truck. A relatively low-powered truck is driven to each pickup spot. The cargo is loaded in sequence so that it can be loaded in station order after being driven to the loading area and backed as close to the airplane as possible. This is the simplest method and is sufficient at airports handling but a small amount of cargo. The disadvantage is that the truck must go to several pickup spots for various kinds of cargo, since there is yet very little centralization in airport warehouses. There is also the danger that the truck will bump the aircraft when backing, and it restricts movement around the aircraft when loading and unloading (see Fig. 39).

Trucktrain. This is the familiar line of trailers pulled by a small tractor seen on many airports. The trailers are preloaded at each pickup spot, attached to the tractor, and pulled to the airplane. This is a good method, as the separate trailers can be placed at the best spots alongside the airplane, the small units are easy to maneuver, segregation of kinds of cargo is easy, and the tractor may be detached from the train and used for other purposes during loading and unloading. The disadvantages of this method are that, since the cargo is broken up into small units, care must be taken to prevent the loading sequence and arrangement from being disturbed and that, unless the carts are equipped with removable sides, they are not suitable for lifting by fork-lifts in loading (see Fig. 40).

With the cargo alongside the aircraft by one or a combination of the methods just described, it now has to be placed aboard. When the DC-3 was the only aircraft used to any extent by the carriers, a system of ladders, loading stands, and other similar equipment was used to enable a sort of bucket-brigade method of hand loading. But as volume of freight and express grew and other aircraft, like the DC-4, came into use after the close of World War II, the carriers found that the old lift-and-lug method was too slow. They then gave attention to the development of mechanical loading, which took the form of:

1. The belt conveyor, which has the advantage of speed, flexibility, and reasonable cost. Its chief disadvantages are that cargo must be



Courtesy: United Air Lines

FIG. 40. The truck train for handling mail and freight between pickup in the airport and the airplane.

handled as separate pieces, that large packages will not fit within side railings, and that the amount of incline sometimes limits its use.

2. The chute, considered the fastest method yet devised for unloading separate packages. The disadvantage of this piece of equipment is that high-density packages come down too fast and low-density ones too slowly. Also, after the chute has been used to unload cargo, it has to be wheeled out of the way, and either a belt conveyor or something else moved into place. This means two or more large pieces of equipment on the airport ramps, just that much more to be moved out of the way between flights and just that much more to be maintained.

The conveyor and chute were fairly satisfactory as an improvement over the bucket-brigade method with the DC-3; but when the airlines began using DC-4's, with their larger doors and nose wheels which kept the floor of the fuselage level when the plane was on the ground, something else was needed. This became even more apparent when the DC-6, the Constellations, and the Convairs came into use, with

their different cargo compartments all at some distance from the ground. The fork-lift truck seemed to be the answer to this problem; and this handling device was adopted by the air carriers as a convenient, flexible system of elevating loads to any door height. Such trucks can also be used to tow carts or other containers around on the airport. Disadvantages of the fork-lift trucks are that a skilled operator is needed to get the full advantage from such equipment and that they are slow for lifting the average single package unless palletized or in a cart which can be elevated to the level of the airplane floor (see Fig. 41).

Scheduled or "Demand" Service

Every now and then, both in connection with domestic and foreign air freight services, the merits of scheduled service versus what has been termed "demand" operations of freight carriers have been under discussion.⁶ The difference between the two terms as used by air freight operators to characterize existing or contemplated services may be defined less in terms of what demand service is than in terms of what it is not. In the first place, demand service is not a scheduled service, since no published schedule is involved. Secondly, it is operated only when sufficient cargo is aboard an all-cargo airplane to justify a departure. Lastly, no rigid route is involved, since operators send aircraft to specific points when freight is available and then only.

It will be seen that from the standpoint of the carrier this concept of demand service might result in very flexible operations. However, either there will be an operational problem in determining when and where each individual flight will be made or there will be a tentative schedule, no matter how flexible or how secret, within the organization of the carrier in order to allow some planning by crew members and operations personnel for departures. A plane hardly ever is waiting with a crew on board when the last needed pound of freight arrives at an airport. There has to be some planning.

From the standpoint of the shipper, demand service, as it is usually understood, means lack of public information. A shipper will never know just when a departure will take place, to what points it will go, or at what time it will arrive at any specific destination unless he is told by the carrier. The attractiveness of this kind of service to shippers will, therefore, depend somewhat on how good the verbal infor-

⁶ See particularly *U.S.-Europe-Middle East Cargo Service Case*, CAB Docket Nos. 3041 and 3818 (1950).



Courtesy: American Airlines

FIG. 41. Use of the fork-lift truck in handling cargo.

mation is that they receive from employees of the carrier. This really does not differ greatly from the freight services that shippers receive from the scheduled carriers, since with these carriers, shippers do not generally know in advance whether freight they offer will leave on

any specific flight, unless space has been confirmed on a reservation basis. However, they do know that a certain number of schedules will be operated between certain points. In view of the published schedules of a certificated carrier, a shipper will have more definite information on the amount of space which will actually be operated between points and the average flight time freight is actually lifted.

From the standpoint of the carrier, nonscheduled demand service appears to be a more flexible operation offering substantial economies through the ability to attain maximum load factors. However, this apparent flexibility will be sure to be limited, particularly with respect to return flights, by the necessity of obtaining some reasonable utilization of equipment. The experience of nonscheduled operators thus far does not show high utilization. It has been maintained that it is not economical operation for a carrier to provide a scheduled amount of service, as the certificated carriers must do, day in and day out between points where there is usually no freight, only to have what may turn out to be an inadequate amount of space available at times when a demand develops. But the fact is that the so-called "scheduled" service of the certificated airlines is more flexible than it seems to the casual observer. Schedules are changed frequently to meet seasonal trends in traffic; extra sections are operated at times; and flights are occasionally canceled entirely. In essence, the nonscheduled and the certificated cargo carriers try to do the same thing, that is, to anticipate the demand for service between points and to plan on sufficient flights to carry the available traffic. An operator with no published schedules is merely able to make more minute changes in operations without public notice.

On the other hand, the operator having no published schedules is less subject to supervision by the Civil Aeronautics Board and affords shippers less opportunity for advance planning of their activities. Published schedules serve to indicate the general level of service between points without the necessity of actual contact with the carrier. Their absence requires a shipper in each instance to find out from the carrier whether any service is actually operated to certain points and, if so, within what period of time a shipment can be transported. The nonscheduled or demand type of service seems particularly unsatisfactory to the small shipper, whereas it can be modified by the carrier to fit the need of any particular large shipper. Discrimination is, therefore, almost certain to arise. Service to large shippers can be given when and where they desire in preference to the small competitor. The lack of any published schedules also handicaps the small

shippers who might, through a consolidation of shipments, be able to fill an airplane in competition with a large shipper whose cargo by itself would be sufficient to determine the time of departure. The large shipper can always influence the timing of flights, but the lack of public notice of these timings may well prevent the smaller shippers from utilizing them even when less than a full planeload shipment is made by a large shipper.

The lack of published schedules may be of little consequence to shippers between points where there are frequent flights. Between these points the experience of the shippers may well be sufficient economic compulsion to insure equal treatment. However, between points where frequencies by various carriers are limited, the public has a sufficient interest in knowing when a service is available to require some publication of the type of service rendered.

The arguments in favor of demand service are further weakened by the fact that nonscheduled carriers seem unwilling to specify any minimum of freight offered at particular points to justify service, any maximum of time which freight would be held before being returned to shippers in case the minimum amount to justify a flight did not turn up, or even any minimum amount of service between any points. What shippers want in order to make air freight more attractive from their standpoint are the very things which demand service lacks, and such a service would certainly offer no more benefits than the so-called "scheduled" service.

The Air Freight Forwarder⁷

In 1949 the Civil Aeronautics Board permitted freight forwarders to enter air transportation, as was discussed in Chapter 6. They were classified as "indirect air carriers," but the Board made it plain that their relationships with the airlines were strictly those of shippers. Freight-forwarder operations by air were regarded as "experimental" and were to extend for a five-year period. This so-called "experiment" was conducted under circumstances strongly conducive to successful results. The nation as a whole was prosperous from 1949 to 1954. Business activity, already was at a high level, was increasing during most of the period. The air transportation industry experienced its greatest prosperity during those years, and the air freight

⁷ See briefs to the examiner filed by Trans World Airlines, Railway Express Agency, United Air Lines, and Bureau Counsel in the matter of the renewal of Part 296 of the Economic Regulations and an investigation of indirect carriage of property. CAB Docket No. 5947, *et al.* (1954).

business (in its infancy when the period began) developed rapidly.

The situation which existed in the air freight business in 1948 made it a particularly opportune time for air freight forwarders to get a foothold. The airlines had begun developing air freight transportation and had built up a substantial amount of business which the forwarders could divert. Air freight was becoming a natural way of shipping, and the potential business appeared to be large. The habit of shipping by direct carrier had not been established in the public mind and customer-carrier relationships had not been firmly fixed. The service offered by the direct carriers was in a preliminary stage of development, and there had been many complaints about ground-handling delays. The energy and resources of the domestic trunk lines were heavily concentrated on operational freight problems and the necessity of providing additional flight equipment and other facilities for the expanding postwar market. These conditions were ideal for establishing new business ventures in the forwarding field.

Another development favorable to forwarder operations occurred in 1950. Military requirements for the Korean airlift severely reduced the number of suitable aircraft that were available to the direct carriers either from their own fleets or on the market. There can be no question but that the shortage of suitable aircraft slowed down the airlines' development of air freight. In many instances during this period, the forwarder, like any other shipper, found it difficult to get the amount of space he wanted at the time he wanted it; but the knowledge of the direct carriers' schedules, routes, and equipment—gained by the forwarder in the ordinary conduct of his business—put him in a better position than many other shippers to take advantage of whatever space was available on any of several airlines. As long as this advantage in finding space lasted, it must have been a valuable competitive asset to the forwarder who knew his business, and must have led many shippers to use forwarders' service.

Finally, the conditions under which the Board permitted the forwarders to operate were extremely favorable. No obligation to serve was imposed. The forwarder could serve where and when he pleased. He could begin, suspend, and again begin operations at any point or at all points. He could exclude commodities which were difficult to handle.

All things considered, it seems unlikely that conditions will ever be more favorable to forwarder operations than they were during this "trial period"; certainly there will be many times when conditions

will be *less* favorable. Under these circumstances, it is surprising that the forwarders have not made a more impressive showing. Due to inadequate breakdown in the forwarders' reports, it is impossible to obtain an entirely accurate figure for the extent to which forwarders have participated in the air freight business, but the best approximations show that their share has been surprisingly small. For example, during the year ended June 30, 1953, the forwarders' participation in the tonnage handled by direct carriers domestically was just over 10 per cent. The forwarders handled about 5½ per cent of the direct carrier tonnage in 1950, a bit over 8 per cent in 1951 and almost 10 per cent in 1952. In the same years, respectively, rail freight forwarders handled 28½ per cent, nearly 32 per cent, and a bit over 34 per cent of the total rail less-than-carload tonnage. The profit picture for the forwarders has been a spotty one. Twenty had a net loss from operations prior to June 30, 1953, and fourteen had a net profit.

The future of the air freight forwarding business does not look particularly bright since the airlines are now in a better position to handle their own air freight business than they were during the trial period. The amount of lift is adequate, equipment and facilities are keeping pace with demand, and the freight service offered by the airlines has been improved and is improving. The integrated pickup and delivery service arranged through Air Cargo, Inc.—which at the time of the *Air Freight Forwarder Case* in 1948 had progressed little beyond the blueprint stage—has for long since proved its usefulness. The air freight business today represents one of the airlines' greatest potential fields for expansion and there can be no doubt that they will develop it aggressively.

On the other hand, there is as yet no proof of the forwarders' ability to operate effectively in this field. Forwarder service as good as direct-carrier service is bound to cost as much, and better-than-direct-carrier service will cost more. Forwarders have undoubtedly diverted freight business from direct carriers by offering service at less than direct carrier rates, but at present the offer of these lower rates appears to be limited for the most part to small shipments below the direct carriers' present minimum rates.

The forwarders have always claimed to be experts in the ground-handling of air freight and generally claim to give better service than the direct carriers at lower cost. Yet they frequently complain that, with their costs, the volume breaks are not large enough to permit their operating at a profit. To the suggestion that they raise their rates (which would make most forwarder rates equal to or higher than

direct carrier rates), the forwarders reply that many shippers will not pay more than the present rates. This allows one of two conclusions to be drawn: either forwarder service is not better than direct carrier service or, if it is better, shippers are nevertheless unwilling to pay extra for it.

The so-called straight or unconsolidated shipment presents another dilemma for the forwarder. If he receives a shipment to a destination for which he can get no other shipments, he cannot consolidate and therefore is obliged to handle it "straight" (that is, as a single shipment) either on the forwarder's airbill or on the direct carrier's airbill. If the forwarder's airbill is used, the forwarder presumably picks up and delivers (for which service he receives the tariff rate), but he has all the expense of handling one of his regular shipments. If, on the other hand, the direct carrier's airbill is used, the forwarder receives the tariff pickup charge and has all the expense usually incident to handling a shipment at the origin station, though he avoids handling the shipment at destination. There is enough competition in pickup and delivery services to justify the assumption that rates for these services are closely related to costs, and that only modest profits are earned. Assuming that the forwarder's pickup and delivery service provides no more than a fair return on his investment, the forwarder incurs (and loses) about half the cost of handling one shipment every time he handles a "straight" shipment at the origin station only; and he incurs (and loses) the full cost of handling such a shipment when he handles it at both the origin and destination station, because, not having consolidated the "straight" shipment with other shipments, there is no spread available to compensate him for his costs. It is true that he may help himself somewhat by consolidating the "straight" shipment to an intermediate point, and then shipping it beyond that point as a "straight" shipment, but this practice will probably delay the freight and will certainly increase his costs, for the "straight" shipment has to be shipped twice.

The forwarder's dilemma is that, although he loses money in handling "straight" shipments, he can scarcely afford to refuse them. If he does refuse a shipment, he loses all chance of making it part of a profitable consolidation. More important, he thereby throws away a competitive advantage he may have over the direct carrier—the ability to handle all the traffic of each customer. An airline can serve a shipper only to the points it serves directly or by connection; with other traffic it can only inform the shipper, as a matter of courtesy, which carriers provide the service. The forwarder can ship anywhere

the airlines go, and it may be convenient for some shippers to have all their freight handled by one carrier. But this convenience will be lost if the "straight" shipments are refused and the shipper is turned back to the direct carriers for at least part of his traffic.

It is difficult to measure the burden imposed on the forwarder by the handling of "straight" shipments. Probably some forwarders have sacrificed the sales argument (of handling all traffic) to obtain relief from the burden, while others have thought it worth while to expand business by offering what amounts to free service.

Despite the dark picture presented by the first five-year "experimental" operation of the air freight forwarders, there is a place for such middlemen provided they can supply a better service to air freight users than the airlines do, and at a price which will yield a profit and which shippers and/or receivers can afford to pay. The most successful air freight forwarding organization to date has been Emery Air Freight, which has rendered a highly specialized, expedited, and personalized service at relatively high rates. (This company has not been regarded as a "typical" forwarder by the airlines since its rates are above airline freight rates and it regards consolidation of shipments as only an incidental part of its business.)⁸ Certainly the experience of Emery Air Freight has shown that to operate successfully a forwarder must first of all promote a service; rates are of secondary importance.

Shippers' Associations⁹

The entry of shippers' associations into the air freight field is a comparatively recent development, and it appears that their activities may help develop air freight business. Such associations are able to save money for their members on the cost of air freight since they operate on a nonprofit or co-operative basis and eliminate the problem of handling the "straight" shipment. In at least some cases, they may be able to provide a more highly specialized service for the particular products they handle than can economically be offered by a carrier serving the public at large. So far these associations have been most active in shipping flowers from California.

⁸ Between 1950 and 1953 it is reported that Emery Air Freight handled from one third to two fifths of the air freight forwarder tonnage.

⁹ A co-operative shippers' association has been defined as a *bona fide* association of shippers which (a) in the name of the association or of the members thereof, ships by air the property of the association or of the members thereof, on a nonprofit basis, for the purpose of securing the benefits of volume rates and/or improved service; and (b) admits anyone to membership on a nondiscriminatory basis who can qualify under its articles of association and bylaws.

Shippers' associations eliminate the "straight" shipment problem because they do not rely on volume breaks for revenue. Instead they prorate the shipping charges of the direct carriers among the shippers and make a flat charge for each shipment handled, the charge being fixed at an amount sufficient to cover expenses. Thus if a shipper-member has freight for a destination to which there are no other shipments, he pays the direct carrier rate on the volume he ships. If there are other shipments to that destination he pays his pro rata part of the direct carrier rate on the combined volume of all shipper members. The shippers' association receives compensation for the services it performs and takes no risks. In theory at least, it should be able to operate for less than a forwarder who is trying to make a profit and must take the risk of finding freight to consolidate in order to earn that profit. The reduced transportation costs achieved through shippers' associations may make possible the air transportation of freight which would otherwise travel by other media.

Chapter

18 * GENERAL AVIATION

PREVIOUS chapters have been almost wholly concerned with airline activities and problems. There is, however, another important part of commercial civil aviation which, in 1953, accounted for 430,000 more cross-country flying hours than the revenue hours flown by all the scheduled airlines, domestic and international. In 1952, forty-seven times as many individual aircraft were used in the general aviation activities listed in Table 50 than were employed in the domestic certificated airline service of the United States. This increasingly important segment of aviation is termed "General Aviation."¹

General aviation includes all civil flying except that done by the scheduled airlines and by the Civil Aeronautics Administration. This represents the largest, though not spectacular nor publicized, portion of all civil flying in the United States. During 1952, approximately 60,000 aircraft engaged in this activity flew 8.2 million hours, the equivalent of 972 million plane-miles or three times the hours and twice the plane-miles flown in the same year by the domestic scheduled airlines.

The basic uses of aircraft in general aviation—such as business transportation and commercial agricultural flying—registered encouraging gains during recent years (see Table 50). Together they accounted for 5,275,000 hours, or 61 per cent of the general aviation total in 1953. On the other hand, instructional and pleasure flying have declined since 1948.

The outlook for the future indicates continued growth, but the volume of flying connected with business transportation, which is now the largest single component of general aviation, will undoubtedly be affected by corporation tax provisions such as the expiration of the excess profits tax, which may make some users of private aircraft more cost conscious. It will also be affected by general business conditions prevailing in any given year. It has been estimated, however,

¹ This discussion is largely based on Civil Aeronautics Administration, *The Airplane at Work for Business and Industry in 1952* (Washington, D.C., 1953).

TABLE 50
HOURS FLOWN IN GENERAL AVIATION BY TYPES, 1928-53
(Thousands of Hours)

YEAR	TOTAL HOURS	BUSINESS*		COMMERCIAL†		INSTRUCTIONAL		PLEASURE		OTHER‡	
		Hours	Per Cent	Hours	Per Cent	Hours	Per Cent	Hours	Per Cent	Hours	Per Cent
1928 ..	748	\$	.....	\$	.....	\$	.....	\$	.....	\$	.....
1929 ..	1,266	\$	.....	\$	.....	\$	.....	\$	.....	\$	.....
1930 ..	1,274	\$	.....	\$	.....	\$	.....	\$	.....	\$	.....
1931 ..	1,083	152	14	281	26	307	28	343	32	.....	.....
1932 ..	877	130	15	215	25	223	25	309	35	.....	.....
1933 ..	795	129	16	200	25	198	25	268	34	.....	.....
1934 ..	846	121	14	207	24	217	26	301	36	.....	.....
1935...	954	132	14	229	24	292	31	301	31	.....	.....
1936 ..	1,059	122	12	245	23	380	36	312	29	.....	.....
1937...	1,173	156	13	227	19	432	37	358	31	.....	.....
1938 ..	1,478	188	13	254	17	577	39	459	31	.....	.....
1939...	1,922	246	13	332	17	755	39	589	31	.....	.....
1940...	3,200	314	10	387	12	1,529	48	970	30	.....	.....
1941...	4,460	250	6	511	11	2,816	63	883	20	.....	.....
1942...	3,786	270	7	473	12	2,680	71	363	10	.....	.....
1943...	||	||	.....	||	.....	||	.....	||	.....	||	.....
1944 ..	||	||	.....	||	.....	||	.....	||	.....	||	.....
1945...	||	||	.....	||	.....	||	.....	||	.....	||	.....
1946...	9,788	1,068	11	943	10	5,996	61	1,686	17	95	1
1947 ..	16,334	1,966	12	1,279	8	10,353	63	2,616	16	120	1
1948...	15,130	2,576	17	1,066	7	8,701	58	2,606	17	181	1
1949 ..	11,031	2,615	24	1,449	13	4,187	38	2,732	25	48	†
1950...	**	**	.....	**	.....	**	.....	**	.....	**	.....
1951...	8,451	2,950	35	1,584	19	1,902	23	1,880	22	135	1
1952...	8,186	3,124	38	1,727	21	1,503	18	1,629	20	203	3
1953...	8,527	3,626	42	1,649	19	1,248	15	1,846	22	158	2

* Includes flying for corporate or executive purposes as well as flying by individuals, including farmers and ranchers, on personal business.

† Includes contract, charter, industrial, and commercial agricultural flying.

‡ Testing, experimental, ferrying, Civil Air Patrol, etc.

§ Distribution by type of flying not available.

|| Data for war years not available.

† Less than one half of one per cent.

** Data not available since no survey was conducted in this year.

Note: This table excludes all aircraft operated by the scheduled airlines and by the Civil Aeronautics Administration.

Source: Civil Aeronautics Administration, *The Airplane at Work for Business and Industry in 1952* (Washington, D.C., 1953), and Civil Aeronautics Administration press release of November 22, 1954.

by the National Business Aircraft Association, that there are 20,000 firms in the United States which can profitably operate business aircraft, and that of this group only a very small number are now flying their own multiengine aircraft.

General Aviation Activities

General aviation is divided into eight different activities, each of which will be discussed briefly:

Business Transportation is the most rapidly expanding segment of general aviation since the close of World War II. Business flying totaled 3,626,000 hours during 1953, over three times the volume of the first postwar year (1946). It accounted for 42 per cent of all

general aviation flying hours and about double the hours of pleasure flying, the next largest category. Business aircraft are used daily for a wide range of important jobs and fly many more hours each year than do the domestic scheduled airlines. In 1952, general aviation business flying exceeded the revenue-hours of the scheduled domestic carriers by some 600,000 hours.

Business flying includes flying performed by companies or individuals in carrying out, in their own aircraft, the operations of their enterprises or professions. It represents the use of an aircraft as a vehicle of transportation for people and cargo, not for hire, in the same manner that a company or individual might use an automobile, truck, train, bus, commercial airline, or boat. Corporations fly executives and technicians from one plant to another; other companies fly merchandise stocks and badly needed repair parts from point to point; sales personnel find that private air travel enables them to handle more effectively a widely scattered territory; farmers and ranchers in large numbers use the airplane in their business; many professional persons such as doctors, lawyers, and engineers also engage in business flying.²

Some 30,500 aircraft were engaged in business flying in 1952. This represents 51 per cent of all those aircraft engaged in general aviation flying during the year. This does not indicate that these 30,500 aircraft were used exclusively for business flying, since it is well known that general aviation aircraft frequently engage in several types of flying activity. It does show, however, that more and more owners are finding an aircraft a very important and useful business tool.³

The small single-engine, executive-type plane of four or five places, with engine horsepower-rating of 145 h.p. and over, accounted for 1,458,000 hours of business flying, or 47 per cent of the business total for 1952. This group includes such well-known models as the Beech

² Many well-known companies are included in the list of those engaged in business flying. It includes such famous names as Bristol-Myers, Coca-Cola, General Electric, International Harvester, Murray Corporation, RCA, Anheuser-Busch, Libbey-Owens-Ford, American Can, Monsanto Chemical, National Lead, Minnesota Mining & Manufacturing, Brooklyn National League Ball Club, Ford Motor, Goodyear Tire & Rubber, Olin Industries, Dow Chemical, J. R. Watkins, Procter & Gamble, J. I. Case, Sears, Roebuck & Co., Gaylord Container Company, General Motors, Sinclair Oil Corporation, and many others.

³ See University of Illinois Institute of Aviation, *Operating Costs of a Light Aircraft Fleet* (Urbana, 1952); Howard F. Weeks, "Business Builds Airfleet," *Dun's Review*, April, 1953; John H. Frederick, "Private Planes—Management's Magic Carpet," *Distribution Age*, December, 1953; National Industrial Conference Board, *Managing Company Airplanes* (New York, 1954).

Bonanza, the Bellanca Cruisemaster, the Cessna 170 and 190-195, the Piper-Stinson Voyager, and the Ryan-North American Navion. Prices for these planes range from about \$8,450 for the Cessna 170 to something like \$22,000 for the Cessna 195. These prices are controlled to some extent by the amount and type of special equipment which may be installed. All other single-engine aircraft together flew some 1,125,000 hours of business flying, or 36 per cent of the year's total. Multiengine aircraft accounted for 541,000 hours of business flying during 1952, or 17 per cent of the total volume.⁴

Commercial Agricultural Flying. Measured by hours flown, the chief commercial uses of aircraft in agriculture are for dusting, spraying, fertilizing, seeding, and defoliation.

Medium and light airplanes are the predominant types used in commercial agricultural flying, but heavy planes and helicopters are also used to a very limited extent. The medium types, used more commonly, have an empty weight of 1,500 to 5,000 pounds and include such planes as the Stearman and the Waco. The light planes have an empty weight of less than 1,500 pounds. Examples of this group are the Aeronca, the Cessna 120, and certain Piper models. Very few aircraft of more than 5,000 pounds are used in agricultural flying, and these are largely used in spraying and dusting, particularly the former. Single-engine models in the heavy category include the military surplus AT-6's and the BT-13's. Like the heavy aircraft, the versatile helicopter has a limited use in commercial agricultural operation, but it is used in more of the agricultural activities than the heavy aircraft.

*Patrol, Survey, and Aerial Advertising*⁵ represent one of the least important divisions of general aviation but one of its fastest growing components. A very substantial proportion of the hours flown in patrol and survey flying is accounted for by pipeline patrol, mapping and survey work, forestry patrol, aerial photography, and hunting predatory animals and birds. The increasing use of aircraft for patrol and survey work stems from the ease, economy, and rapidity with

⁴ There is general agreement among civil aircraft manufacturers and many business users that there is a real need for a small twin-engine, 4- or 5-place aircraft suitable for executive travel. The success of the Aero Commander and the British de Havilland Dove has stimulated other producers to develop new, light twin-engine aircraft such as the Beech Twin Bonanza, the Cessna 310, and the Piper PA-23 Apache. Prices for these planes will run about \$65,000 for the Beech, somewhere around \$45,000 for Cessna, and from \$32,500 to \$35,000 for the Piper. See Lois C. Philmus, "Corporate Aircraft: Profile for Tomorrow," *American Aviation*, Nov. 10, 1952.

⁵ The term "industrial flying" is widely used to cover patrol, survey, photography, and aerial advertising work.

which these activities can be performed from a moving elevated point such as an airplane or helicopter. Observations or photographs can be made quickly and accurately despite difficult surface conditions that would complicate operations on the ground. Aerial advertising, while not involving many hours of flying time, uses novel devices which will probably continue to meet certain advertising needs.

Passenger and Cargo Carrying for Hire includes the air taxi services, charter or hire flights by fixed-base operators (aircraft service operators), and the domestic operations of the irregular air carriers which carry passengers, cargo, or both. Aircraft carrying passengers and cargo for hire flew a total of 574,000 hours in this activity in 1953, not counting the hours flown on military-contract operations by the irregular carriers.⁶ In 1952, the domestic civil operations of the irregular air carriers operating under the exemption authorization of the Civil Aeronautics Board (see Chapter 6) accounted for an estimated 150,000 hours, or about 21 per cent of the total flown in this activity.

Most of the flying time reported in 1952 for passenger and cargo carrying for hire was accumulated on the larger single-engine and multiengine aircraft. Single-engine planes of three places or more accounted for almost half of the flying time in this category, and three fourths of these hours were flown by the single-engine craft of 145 h.p. or more. Examples of planes of this type are the Beech 17's, D-18's and 35's, the Cessna 170's and 190's, the Navions, and the Stinsons. Multiengine aircraft were flown for a total of 215,000 hours in carrying passengers and cargo for hire. Over half of these hours (133,000) were accumulated on planes with engine ratings of 2,001 to 4,000 h.p. The two models which account for most of the planes in this group are the DC-3 and the C-46. Aircraft such as the DC-4, with engine ratings exceeding 4,000 h.p., were used for 37,000 hours in carrying passengers and cargo for hire in 1952. Thus, multiengine aircraft with engine ratings over 2,000 h.p. were used for 170,000 hours in this type of flying. Of these 170,000 hours, 88 per cent were flown by the irregular air carriers. A total of 5,450 aircraft, or 9 per cent of the active civil aircraft covered by the survey, were engaged at some time during 1952 in carrying passengers and cargo for hire.

Instructional Flying has declined in importance ever since 1947 and in 1952 reached the lowest point since 1939, with the exception of the war training years—1940 and 1941. Aircraft were used in

⁶ See John H. Frederick, "Why So Much Military Traffic Moves by Air," *Railway Age*, June 28, 1954.

solo and dual instruction for a total of 1,248,000 hours representing less than one seventh of the time devoted to this activity in 1947, the peak year for flight training under the "GI bill." In 1953, this type of flying accounted for 15 per cent of the hours flown by general aviation aircraft, as compared with 23 per cent in 1951.

Practically all the instructional flying was accomplished in single-engine aircraft, and 82 per cent of the hours flown in this activity were flown in one- and two-place craft. Over half the instructional flying in one- and two-place craft was performed in planes with engine ratings of 65 h.p. or less, and this type of flying accounted for 40 per cent of the hours flown in these aircraft. Single-engine planes of three or more places were used for 18 per cent of the instructional flying, and about two thirds of these hours were accumulated on those planes having engine ratings of 145 h.p. or more.

Pleasure Flying represents, usually, an auxiliary use of aircraft purchased primarily for business, professional, or commercial uses. The same advantages which made the airplane an attractive purchase for business use carry over into pleasure flying. It permits visits and vacations at more distant locations and hunting and fishing trips to areas not easily reached by automobile. A majority of aircraft owners report that some time is spent in pleasure flying, but rarely as much as the flying time for the basic use for which the aircraft was obtained. Aircraft were used for 1,846,000 hours of pleasure or sport flying in 1953.

Testing, Experimental, Ferrying, and Government Flying. This category, the smallest in general aviation, includes the testing of new aircraft as a part of the certification process and of old aircraft in connection with inspection, maintenance, and installation of equipment; the flying of experimental aircraft; the ferrying of new aircraft from factory to dealer and the movement of used planes from seller to buyer; and flying by local, state, and federal governments, excluding that done by the Civil Aeronautics Administration. In addition to the above activities, this category includes the time spent in Civil Air Patrol flying. Much of the flying in this category is largely incidental to all general aviation flying, since a few hours in testing, ferrying, or Civil Air Patrol may be accumulated on all types of active aircraft in the course of a year. It is listed as "Other" in Table 50 and accounted for 158,000 hours flying time in 1952.

DISCUSSION QUESTIONS¹

CHAPTER 1

TRANSPORT AIRCRAFT

1. Outline briefly the early French experiments with lighter-than-air machines and indicate why all such aircraft lacked commercial utility.
2. Outline the early experiments with heavier-than-air machines culminating in the Wright brothers' success at Kitty Hawk.
3. Show how commercial aircraft, over the last twenty-five years have been made obsolete by the introduction of newer designs. Into what major change periods may this transition be divided.
4. Look over the last four issues of *American Aviation* or *Aviation Week*, and see if you can locate any articles or news items dealing with any coming change in air transport equipment. Write a brief statement summarizing anything you may find.
5. Discuss the factors which have entered into the rapid and continuous modernization of airline equipment.
6. Differentiate clearly between the turbo-prop and turbo-jet engines.
7. Why is it possible that the true jet engine may not soon be economical for commercial aircraft?
8. What are the commercial possibilities of the helicopter?
9. As the development of air transportation proceeds, what distinct types of planes for use in scheduled services will probably develop? What are the names used for some of these types already in use?
10. Briefly discuss the design criteria and operating requirements which the airlines seem to agree are desirable from their point of view.
11. What is meant by the "traffic problem" in airline operation, and how does it affect the type of equipment used?
12. If you have traveled by air recently, what were your own reactions to the aircraft in which you flew? Do you have anything to add to the passenger reactions discussed in the text?
13. In deciding the adaptability of a particular type of aircraft to a specific type of operation, the airlines use certain criteria. How may these be grouped? Discuss the important points under each.
14. Define the following: block speed, pay load, load factor.

¹ The purpose of these discussion questions for each chapter is not only to aid the student in his study of the text but also to familiarize him with the trade papers in the field as well as with the publications of the Civil Aeronautics Board and the Civil Aeronautics Administration. See Bibliographical Note, which follows.

CHAPTER 2

AIRPORTS AND AIRWAYS

1. Define what is commonly called an "airport."
2. Briefly outline the historical development of airports in the United States.
3. When was federal aid first extended to civil airports not held primarily for the use of the federal government?
4. How may airports be classified according to: size, types of service which they are designed to furnish, and nature of ownership or control?
5. What criticism has been levied against the Civil Aeronautics Administration for its "service" classification and the runway specifications laid down for airports? Into what classification may the airport in your home community be placed?
6. Do you think we have an adequate system of airports in this country? On what basis do you make your judgment?
7. What are the chief problems of airport location in relation to the city it serves?
8. What means have been or may be taken to protect airport approaches?
9. What are the various forms of airport administration? What form is in use in your home community? If you do not have an airport, what type might be considered suitable and adequate?
10. What are the weaknesses of combining airport management with the functions of other city departments? Is there any good reason today for managing an airport in this way?
11. What can you say for and against the establishment of a separate airport department in a city administration?
12. List the advantages and disadvantages of an independent airport commission.
13. What are the chief sources of airport income?
14. Visit the airport nearest you at this time and report briefly on: (a) type of administration and management and (b) sources of income.
15. Define an "airway."
16. Outline the chief purposes of airway traffic control. How does it differ from airport traffic control?
17. Define: fan markers; L/MF Ranges, VHF Ranges, DME equipment.
18. Many hold that our system of airways and airport traffic control has been entirely inadequate for some years. On what is this contention based?
19. Go through the last few issues of *American Aviation*, *Aviation Week*, and *Aero Digest*, and report on any articles found dealing with improvements in airway traffic control.
20. Go through the last few issues of *American Aviation*, *Aviation Week*, and *Aero Digest*, and report on any articles concerned with airport management, airport construction, and the like which you may find.

21. Who pays for the construction and operation of: (a) airports and (b) airways?
22. What is meant by the common system of air traffic control?
23. In establishing charges for the use of airways why is the "units-of-use method" not considered suitable as a measure by itself?
24. What is considered to be the most satisfactory measure for the use of airways by civil users?
25. Do you feel that the scheduled airlines have reached a point in their development where they could carry the financial burden of airways user charges? Why or why not?
26. Discuss the "direct" versus the "indirect" method of assessing user charges.

CHAPTER 3

COMMERCIAL AIR CARRIERS²

1. Outline the various periods in the development of the airlines of this country, showing the significant developments in each.
2. What were the chief problems faced by the airlines directly after the close of World War II?
3. Into what classifications does the Civil Aeronautics Board divide certificated air carriers? Define each, and give an example.
4. What was the effect of the "grandfather" clause of the Civil Aeronautics Act³ upon the early development of our airline route pattern?
5. What is meant by the term "irregular service carrier?"
6. Trace the development of irregular service carriers in our air transport system.
7. Would you say that there was more or less justification for irregular service carriers in transporting passengers than in transporting cargo? Why?
8. Define an "indirect air carrier."
9. What is the Air Transport Association of America? Go through the last four issues of *American Aviation* or *Aviation Week*, and report briefly on any items concerning recent activities of this association.

CHAPTER 4

REGULATORY AGENCIES

1. Review some of the early arguments advanced for the control of aviation by the federal government rather than by the various states.
2. What were the chief provisions of the Air Commerce Act of 1926?

² A copy of *American Aviation Official Airline Guide* is useful with this chapter.

³ Wherever the Civil Aeronautics Act is referred to in the various discussion questions, it is suggested that the student refer not only to the text under review but to the pertinent portions of the Act of 1938 itself found in Appendix A.

3. Why do you think it became necessary to adopt the Civil Aeronautics Act of 1938, and why did Congress lean so heavily upon already existing legislation dealing with ground carriers in formulating this act?
4. In what way did the Civil Aeronautics Act substitute one federal statute and agency for those which had previously been regulating the industry?
5. In what ways did Plans 3 and 4 for the reorganization of the federal government affect the Civil Aeronautics Board and Civil Aeronautics Administration?
6. What relation do the Civil Aeronautics Board and the Administrator of Civil Aeronautics bear to the Department of Commerce?
7. Quote the "statement of policy" set forth in the Civil Aeronautics Act.
8. What economic regulation of air carriers is provided for in the Civil Aeronautics Act?
9. What tests has the Board developed in arriving at an answer as to which of two carriers is most "fit, willing and able?"
10. What three primary factors are usually weighed by the Board in any given situation in arriving at a decision as to operation of competing services?
11. What factors must the Board take into consideration in regulating air carrier rates?
12. Differentiate between "air carrier operating certificates" and "certificates of convenience and necessity."
13. Do you believe that the Civil Aeronautics Act of 1938 needs amendment at this time? Why or why not?
14. What amendments to the Act have been suggested as desirable?
15. Illustrate the legislative, judicial, and executive functions of the Civil Aeronautics Board.
16. Briefly state the main activities of the following divisions of the Civil Aeronautics Board: Office of Compliance, Bureau of Safety Regulation, Bureau of Air Operations and Bureau of Hearing Examiners.
17. Briefly state the main activities of the following divisions of the Civil Aeronautics Administration: Organizations and Methods Office, Office of Aviation Safety, Office of Federal Airways and Office of Airports.
18. What is the work of the Air Coordinating Committee?
19. Since the Civil Aeronautics Act (Title IV) applies to interstate carriers only, what is the temptation for states to undertake economic regulation? Should this be permitted? Why or why not?
20. What are the reasons for the strong national interest of the United States in airspace?
21. What is the definition of "navigable airspace" in the Civil Aeronautics Act, and what confusions have arisen in the public mind because of this definition?
22. Discuss the noise problem at airports and the importance of proper zoning around airports as a matter of "airspace" rights.

CHAPTER 5

ECONOMICS OF COMMERCIAL AIR TRANSPORTATION

1. What are the characteristics possessed in common by the commercial air carriers which influence economic adjustments in the industry?
2. What characteristics of a public utility are possessed by the commercial air carriers? How is this reflected in regulation?
3. What is the chief revenue source for the airlines? Do you believe this will continue to be so? Give reasons for your answer.
4. What is included in the Civil Aeronautics Board accounting classification of "Ground and indirect expense"?
5. Why has the analysis of airline expenses always been a difficult problem?
6. Illustrate why and how the cost of maintenance and overhaul to an airline is high, and state the economic significance of such a condition in the business.
7. Why will two airlines have the same characteristics as to size, volume of traffic, and operations, but having a different number of stations, experience different cost levels?
8. Explain the relation of airline expenses to the volume of traffic.
9. Distinguish between "common" and "separable" costs in the airline business.
10. Is the principle of making rates "that will move the traffic" as applicable to air carriers as it is to railroads? Explain fully.
11. Why is it that, at least over a substantial range of traffic, total airline cost does not increase as rapidly as traffic; and thus average cost per unit of business handled falls?
12. What is the place of the "value of service" concept in airline rate making?
13. Do you agree that, if a service cannot cover its out-of-pocket costs regardless of the rate set, it should be abandoned, unless continued operation is essential to the general welfare? Explain.

CHAPTER 6

CIVIL AERONAUTICS BOARD POLICY—COMPETITION

1. What factors give rise to competition in air transportation?
2. What have been the fundamental considerations used by the Civil Aeronautics Board in disposing of new route applications?
3. How has the Board itself increased competition in air transportation through its various actions?
4. Digest the following Civil Aeronautics Board cases (provided the necessary volumes of the Board's Economic Decisions are available in your library): 2 CAB 16 (1940), 6 CAB 319 (1945).
5. What is the total amount of traffic that should determine whether com-

- petition is in the public interest? Has the Board followed this principle? Cite any pertinent cases as shown in the footnotes of the text.
6. Trace the development of Board policy on "entry into air transportation," citing any pertinent cases as shown in the footnotes in the text.
 7. Give several examples of cases where the Board has taken an attitude more liberal than its prewar attitude toward the entry of new companies into air transportation.
 8. Why has the Board hesitated to certificate a feeder route, as such, to a trunk-line carrier?
 9. What is your opinion of the Board's policy as to entry of new carriers into air transportation?
 10. Trace the development of the Board's policy on entry of surface carriers into air transportation, citing any pertinent cases shown in the footnotes of the text.
 11. What reasons may be stated for permitting the temporary certification of freight forwarders? Why was this opposed by the scheduled airlines?
 12. Why may it be said that "the air freight rate and the question of certifying forwarders is now inextricably mingled"?
 13. Go over the last four issues of *American Aviation*, *Aviation Week*, or *Traffic World*, and write a brief report on any cases now under consideration or recently before the Board involving certificates of convenience and necessity.

CHAPTER 7

CIVIL AERONAUTICS BOARD POLICY—COMPETITION (*Continued*)

1. What is meant by the "balanced competition theory of the Board"?
2. Digest the following Civil Aeronautics Board cases (provided the necessary volumes of the Board's Economic Decisions are available in your library): 2 CAB 16 (1940), 4 CAB 373 (1943), 4 CAB 254 (1943).
3. What would you say were the chief obstacles which have prevented more effective action by the Board in the supervision of the over-all route pattern?
4. What is the "place" of the local service airline?
5. What reasons can you give for the further certification of local service airlines?
6. What reasons can you give against the further certification of local service airlines and possibly for the abandonment of some already certificated?
7. What are the cost handicaps under which local air service must operate?
8. How have the certificated local airlines attempted to improve the situation brought about by their high-cost operations?
9. Are there any indications that the Board may permit local service air carriers to become trunk lines? What are they?

10. How did the desirability of nonstop operations and route consolidations arise?
11. What are the advantages of interchange of equipment and the objections that have been raised thereto?
12. Trace the development of Board policy as to "irregular air carriers," citing any pertinent cases shown in the footnotes of the text.
13. Outline the ways in which irregular carriers may be said to have been a "significant force in the competitive picture."
14. In what ways are the provisions of the Civil Aeronautics Act dealing with mergers and acquisitions of one air carrier by another more complex than those applying to the award of certificates of convenience and necessity?
15. How does the Civil Aeronautics Board define a monopoly? (Discuss 1 CAA 723 (1940) in this connection.)
16. Digest the following Civil Aeronautics Board cases (provided the necessary volumes of the Board's Economic Decisions are available in your library): 1 CAA 739 (1940), 7 CAB 365 (1946), 6 CAB 217 (1940).
17. Check through the last few issues of *American Aviation*, *Aviation Week*, and *Traffic World*, and report on any merger cases now pending or recently passed upon by the Board.
18. Outline what may be said to be the Board's minimum criteria in connection with mergers or consolidations.

CHAPTER 8

CIVIL AERONAUTICS BOARD POLICY—MAIL RATES

1. What is the "fourfold significance" of mail rates in connection with the national policy for the development of adequate air service?
2. What is your understanding of the term "subsidy" in connection with mail rates? If this departs from the discussion in the text, give reasons. (You need not necessarily agree with the author.)
3. Trace the development of air mail rates prior to and after the passage of the Civil Aeronautics Act in 1938.
4. What is the difference between the Board's classification of mail rates as "service" and "need"?
5. What is the importance of the provision in the Civil Aeronautics Act that the Board must consider "economy and efficiency" of management in setting mail rates?
6. What are at least two basic defects in the system of air mail and subsidy payment as it has developed?
7. Why is it important that carriers be placed on "final" mail rates as soon as possible?
8. Trace the development of the "service mail rate" principle.
9. How does the fact that the Government is the only purchaser of mail service complicate the making of mail rates?

10. Trace the development of the campaign to separate mail pay from subsidy.
11. Define a "service rate" and describe the steps through which the Board "administratively" determines such rates.
12. Why is it likely that the level of subsidy support for international operations of United States air carriers will tend to increase over the next few years?
13. What was the purpose of the "experimental rates" instituted by the Post Office Department in 1953?
14. What appears to be the current mail rate problem as it reflects the differing points of view of the Post Office Department and the Civil Aeronautics Board?
15. Go through the past four issues of *American Aviation*, *Traffic World*, and *Aviation Week*, and be prepared to report on any mail rate developments reported therein.

CHAPTER 9

CIVIL AERONAUTICS BOARD POLICY—FREIGHT RATES AND PASSENGER FARES

1. Trace the history of air freight rates to date. Have we had a "rate war"? What evidence can you produce on either side?
2. What has been the Board's policy on setting minimum freight rates, and how do you feel about this method of controlling the rate situation?
3. Discuss the airline backhaul problem and show how directional rates can be used to overcome it at least in part.
4. Define accumulation, assembly, and distribution as set forth in airline tariffs. What is the purpose of such rules?
5. What is the main object of the consolidated air freight tariff?
6. What has been the attitude of the Board toward passenger fares?
7. Discuss the various experimental fares introduced by the airlines in 1948 and 1949 and indicate the success of each.
8. Check through the last four issues of *American Aviation*, *Aviation Week*, and *Traffic World*, and report on any items concerning airline passenger fares. (Do the same for air freight rates.)
9. What are "common fares" and why are they important to carriers and communities?
10. Summarize the general rate policy which might seem to apply to airlines in the next few years.

CHAPTER 10

INTERNATIONAL AIR TRANSPORTATION POLICY

1. What was the international air transportation policy of the United States prior to World War II?

2. Outline the part played by Pan American Airways in international air transportation prior to World War II.
3. Digest the following Civil Aeronautics Board cases (provided the necessary volumes of the Board's Economic Decisions are available in your library): 6 CAB 319 (1945), 6 CAB 857 (1946), 7 CAB 83 (1946), 7 CAB 209 (1946), 7 CAB 285 (1946).
4. Trace the development of Board policy for the development of competition on international routes.
5. What might be said to have been the pre-World War II policy of European countries for the development of international air transportation?
6. What objectives for United States international air policy seemed to emerge from our activities during World War II?
7. What are the chief international conventions under which air transport between the countries of the world is carried on?
8. What led the United States to take the lead in 1944 and to call the international conference on civil aviation held in Chicago the latter part of that year?
9. Outline the proposals introduced by various nations at the Chicago conference. What were the results of this conference?
10. Define the "five freedoms."
11. The policy of the United States has been to obtain air rights by bilateral agreements. What criticisms have been levied at this method? Are they valid in your opinion, and what might be a better method?
12. Distinguish between operations of foreign aircraft authorized by the Civil Aeronautics Act of 1938 and operations authorized by the Air Commerce Act of 1926.
13. What are some of the complaints that have arisen in connection with the Board's issuance of permits to operate foreign-flag airlines into the United States? Do you feel that these are valid? Explain.
14. Does the term "public interest" in connection with international air transport have the same connotation as it has in connection with domestic carriers by air? Discuss.
15. What is the power of the President of the United States over international air routes and air carriers in international service? Why did Congress give him this power?
16. What were the recommendations of the Air Coordinating Committee in its 1954 report as to international air routes and rights?
17. How can we group the needs for technical requirements for physical equipment and rules governing the operation of world airways? Give an illustration of each and indicate how it has been handled to the advantage or disadvantage of the United States.
18. What is a possible definition of a "scheduled international air service"?
19. What authority does the Board have to fix international rates? Should this power be changed? Give reasons for or against.
20. What is ICAO? What is IATA?

21. Check the last four issues of *American Aviation*, *Aviation Week*, and *Traffic World*, and prepare a digest of any articles or news items dealing with international air transportation.

CHAPTER 11

SAFETY IN AIR TRANSPORTATION

1. What may be said to be the chief factors on which safety in air transportation depends?
2. Why is it so difficult to relate the accident rate in air carrier operation to accident rates in other fields of transport?
3. What federal agencies are concerned with the promotion of safety in civil aviation?
4. Distinguish clearly between the functions of the Civil Aeronautics Board and those of the Civil Aeronautics Administration in connection with air safety.
5. Does the twofold regulation of air safety present any difficulties? What are they?
6. What types of accidents are investigated by the Civil Aeronautics Board?
7. What are the arguments for and against the re-establishment of the Air Safety Board?
8. List the chief causes of airline accidents.
9. The statement has been made that "regulations as such cannot bring about conformance to safe operating procedures and standards." Discuss what is meant here.
10. Outline the national policy on aviation safety as stated by the Air Coordinating Committee in its 1954 report.
11. Check through the last four issues of *American Aviation*, *Aviation Week*, and *Aero Digest*, and digest any articles or items dealing with safety in air transportation.
12. What is the liability of a common carrier airline for injury to persons or property in its custody? For injury to persons on the ground?
13. How do airlines protect themselves against the liabilities mentioned in question 11?
14. Explain the "group plan of underwriting."

CHAPTER 12

FINANCING AIRLINES

1. Review the history of airline financing, and point out why the earlier method was necessary and why there has been a trend lately to another policy.
2. How may equipment purchases be financed? What problems arise in the minds of lenders in connection with equipment loans?

3. Why are chattel mortgages more suitable for airline equipment financing than they are for railroads?
4. In what ways has progress recently been made toward facilitating a wider use of equipment trusts as instruments of airline financing, particularly in the international field?
5. What are the arguments pro and con for the control of airline securities by the Civil Aeronautics Board?
6. How may the "profit pattern" of an industry best be viewed and to which of the regulated industries is air transportation most comparable?
7. In what position does the air transportation industry find itself in competing with other regulated industries for capital?
8. Check over the last four issues of *American Aviation* and *Aviation Week*, and prepare a digest of any news items or articles dealing with recent airline financing.
9. What forms have public aid to air transportation taken in the various countries? (Discuss this from an historical standpoint.)
10. Under what circumstances may public aid to air transportation be said to be justified?
11. What forms has public aid to air transportation taken in the United States?
12. Outline what may now be considered to be the national policy on airline subsidies.

CHAPTER 13

AIRLINE ORGANIZATION

1. What are the major management functions of any airline?
2. Discuss each of the principles of organization as they apply to airlines.
3. What inherent characteristics of the airline industry (together with conditions under which the industry must operate) must be considered in formulating an organization plan for any company?
4. Outline the main activities of each of the chief departments found in most airline organizations.
5. Trace through the last four issues of *American Aviation* and *Aviation Week*, and digest any articles you notice on the subject of airline organization, changes in existing organizations and the like.

CHAPTER 14

AIRLINE PASSENGER TRAFFIC DEVELOPMENT

1. Why were sales problems neglected by airline management in the earlier days? Is the same true today?

2. How may one measure the development of airline passenger traffic?
3. What factors have played a part in airline passenger growth?
4. Are the same factors of equal importance today?
5. Give a brief review of the historical development of air passenger fares.
6. To what extent have the airlines penetrated the travel market? Do you think this will continue to increase or will it be likely to remain at the present point or even decrease? Give reasons for your reply.
7. Into what broad groups may prospects for air travel be divided? Where do you personally fall in this grouping?
8. Classify prospects for air travel in the order of their importance and accessibility, in combination with the volume of business to be expected from each group.
9. What have been the sales resistances to be overcome in getting people to travel by air? Do you feel that any of these still continue to be strong? Discuss.
10. What were the advantages to the airlines from the adoption of the Air Travel Card method of selling air transportation? What were the advantages to the subscribers?
11. Outline the methods adopted by the airlines to increase air travel since the close of World War II.
12. Check over the last four issues of *American Aviation*, *Aviation Week*, and *Traffic World*. Pick out any reports of effective sales efforts by airlines or airline personnel, and be ready to report on these to the class.
13. Define the term "air coach" and discuss the growth of this service.
14. What channels of publicity for airlines are used in your vicinity?
15. Classify the airline "public."
16. What forms may public relations work take?
17. Discuss the use of various media for airline public relations work.
18. Cite an example of good airline public relations and one of bad if you have observed any such.
19. Check through the last four issues of *American Aviation* or *Aviation Week*, and digest any articles or items on public relations activities of the airlines.

CHAPTER 15

AIRLINE PASSENGER HANDLING

1. Discuss the importance of a good reservation system to an airline.
2. Report on any personal experiences you may have had reflecting good or bad reservation practices.
3. What are the principal methods of handling reservations?
4. Check over the past four issues of *American Aviation* and *Aviation Week*, and report on any articles or items concerning airline reservation systems.

5. Define "reconfirmation" and discuss the benefits the airlines believe came out of the system.
6. Why are "flight advisory" reports important passenger-handling tools?
7. What is meant by "routine," "subject," and "cancel" in connection with flight advisories?
8. Define the following terms in connection with ticketing passengers: Circle trip, Open jaw, Joint issue.
9. What factors usually govern the selection of one route over another by an individual passenger?
10. What is the airline policy as to ticket refunds?
11. Cite any personal experience showing good or poor passenger-handling technique by an airline.
12. Check over the past four issues of *American Aviation* and *Aviation Week*, and digest any items concerning airline passenger-handling technique.

CHAPTER 16

AIR EXPRESS AND FREIGHT DEVELOPMENT

1. Trace the early history of air express development.
2. What was "General Air Express," and what were the reasons for its abandonment?
3. Under what sort of an arrangement does the Railway Express Agency handle air express with the airlines?
4. Why was air express so slow in developing as a major part of airline activity?
5. Trace the development of air express after it became a unified system under the Railway Express Agency.
6. What was the effect of World War II on air freight development?
7. Which was the first airline to publish rates for "air freight"?
8. Trace the postwar developments in air freight transportation.
9. What part did the nonscheduled and contract air cargo operators play in postwar development?
10. What is your opinion as to the air freight potential in this country? (It need not agree with the figures quoted in the text.) How do you measure it?
11. What are the chief advantages to shippers from the use of air freight transportation?
12. What factors must be considered in any plans for future air freight development?
13. Check through the last four issues of *American Aviation*, *Aviation Week*, and *Traffic World*, and digest any articles or items you may see concerning air freight development.
14. What three chief factors will probably be considered in placing commodities into classes for air freight rate making? Discuss each briefly.

CHAPTER 17

AIR FREIGHT HANDLING

1. What factors complicate the handling of air freight compared with the handling of air passengers?
2. What changes have taken place in the "pattern of air cargo" in recent years? Do you believe this trend is likely to continue? Give reasons for your answer.
3. Why has the growth of all-cargo operations in recent years forced the carriers to pay attention to what is known as "the density problem"?
4. What principles should be observed in packing for air freight shipment?
5. What factors govern consideration of "security" for air freight?
6. Trace the development of the system by which the airlines have handled the pickup and delivery problem.
7. State the functions of Air Cargo, Inc., as it operates today.
8. What types of truck operators are involved with Air Cargo, Inc., in coordinating air and ground transportation?
9. Why is airport handling of air cargo still on a more or less makeshift basis? Can you make any suggestions for improvement?
10. Trace through the last four issues of *American Aviation* and *Aviation Week*, and digest any articles you notice on the subject of air cargo handling.
11. Under what circumstances do airlines consider themselves not liable for loss and/or damage to cargo?
12. How may a shipper protect himself fully against loss and/or damage to air cargo? Discuss any possible advantages from not relying wholly on carrier liability.
13. Why does airport handling of air freight continue to be a more or less makeshift affair?
14. Outline the various methods of handling air freight on airports.
15. Differentiate between "scheduled" and "demand" service for air cargo.
16. In what ways may discrimination arise under a system of "demand" air cargo service?
17. Why was the year 1948 a good time for air freight forwarding to start?
18. What appears to be the future for the air freight forwarders?
19. Discuss the problem presented to freight forwarders by the so-called "straight" shipment.
20. What is the place of the shippers' association in handling air freight?

CHAPTER 18

GENERAL AVIATION

1. How may the term "general aviation" be defined?
2. What eight types of flying are generally referred to as "general aviation activities"?

3. Do you know of any industry, personally, that makes use of aircraft in connection with its activities and which might be included in any discussion of general aviation? If so, give a brief description of such activities.
4. What might be said to be the advantages for owning and operating your own aircraft for business flying?
5. What do you see as the future for pleasure flying? For business flying?

BIBLIOGRAPHICAL NOTE

THE bibliography of commercial air transportation is very largely found in trade papers serving the air transportation industry and in the papers read by those using the services of commercial air carriers. To attempt to present a complete bibliography would, therefore, be impossible in a volume of this size. The author has, however, attempted to present a bibliography of the most important sources of information in the footnotes throughout the book. By including rather full notes on sources, the author feels that he has given credit where credit is due and, at the same time, has directed the reader to further sources of information. Thus the reader may limit his research to those subjects in which he is most interested and may be spared the necessity of having to search through a bulky bibliography at the end of the volume, as is customary in many books. In other words, the footnotes throughout this volume present a fairly complete working bibliography of commercial air transportation.

The trade papers in the field of aviation all include material on its commercial aspects, but some of them stress this subject more than others. The best papers to read for current developments are *American Aviation*, published semimonthly by American Aviation Publications, Inc., Washington, D.C., *Aviation Week*, published weekly by the McGraw-Hill Publishing Co., New York, and *Air Transportation*, published monthly at 10 Bridge St., New York. *Flight*, published monthly in Dallas, Texas, specializes in coverage of the news and problems of the local service airlines.

Publications in the nature of "working tools" of the commercial air transportation industry are:

Traffic News, published daily by American Aviation Publications, Washington, D.C., which digests, abstracts, analyzes and indexes all Civil Aeronautics Board economic regulatory actions and filings.

American Aviation Daily, published daily by American Aviation Publications, Washington, D.C., which is the newspaper of the industry.

Official Airline Guide, published monthly by American Aviation Publications, Chicago, which contains all airline schedules, rates, regulations for passenger and cargo transportation by commercial operators.

American Aviation Directory, published every six months by American Aviation Publications, Washington, D.C. This is a complete reference guide to administrative and operating personnel of the airlines, aircraft and engine manufacturers, accessory and equipment manufacturers, organizations, schools, and United States and foreign aviation groups and departments.

Traffic World, published weekly and covering all fields of transportation by Traffic Service Corp., Chicago.

The most scholarly publication, appearing quarterly, is *The Journal of Air Law and Commerce*, published by Northwestern University, Chicago.

The Aeronautics Branch of the United States Department of Commerce started publishing the *Air Commerce Bulletin* on July 15, 1929; and this was continued by the Civil Aeronautics Authority until December 15, 1939, when it assumed its present title of *Civil Aeronautics Journal*. This is, of course, the primary source of much statistical material as well as information on current developments.

The Civil Aeronautics Administration, the Civil Aeronautics Authority, and the Civil Aeronautics Board have issued many studies dealing with the commercial side of air transportation. Lists of these are obtainable from the respective agencies. From time to time, either the Senate or the House has appointed committees to study various aspects of the subject of air transportation in general and commercial activities in particular. Lists of such committee reports as have been published are available from the Superintendent of Documents, United States Printing Office, Washington, D.C.

The Economic Decisions of the Civil Aeronautics Board have been published as follows:

- Vol. I, from August, 1938, to July, 1940
- Vol. II, from July, 1940, to August, 1941
- Vol. III, from August, 1941, to December, 1942
- Vol. IV, from December, 1942, to June, 1944
- Vol. VI, from July, 1944, to May, 1946
- Vol. VII, from June, 1946, to March, 1947
- Vol. VIII, from April, 1947, to December, 1947
- Vol. IX, from January, 1948, to December, 1948
- Vol. X, from January to November, 1949
- Vol. XI, from December, 1949 to August, 1950

There have been various bibliographies of books and publications dealing with aeronautics issued during the last few years, all of which include the chief publications on commercial air transportation. One of the best of these is issued by the Library of Congress. Another is issued by the Institute of the Aeronautical Sciences.

The following books and other publications may be said to be the most important on the subject of commercial air transportation and its managerial and economic aspects. They, also, are those most readily obtainable and should form the nucleus for any library on the subjects covered.

AIR TRANSPORT ASSOCIATION OF AMERICA. *Little Known Facts about the Scheduled Air Transport Industry*, annually since 1939. Washington, D.C.

ARNHYM, ALBERT A. *Comfortization of Aircraft*. New York: Pitman Publishing Corp., 1944.

ASSOCIATION OF AMERICAN RAILROADS. *Air Transportation*. Washington, D.C., 1947.

BAKER, MORRIS B. *Airline Traffic and Operations*. New York: McGraw-Hill Book Co., 1947.

BLOMQUIST, A. E. *Outline of Air Transport Practice*. New York: Pitman Publishing Corp., 1941.

- BOLLINGER, L. L.; PASSEN, A.; and McELFRESH, R. E. *Terminal Airport Financing and Management*. Boston: Harvard Graduate School of Business Administration, 1946.
- BOLLINGER, L. L., and TULLY, A. H., JR. *Personal Aircraft Business at Airports*. Cambridge, Mass.: Harvard University, 1948.
- BRUNO, HARRY. *Wings over America*. New York: Robert M. McBride & Co., 1942.
- BURDEN, W. A. M. *The Struggle for Airways in Latin America*. New York: Council on Foreign Relations, 1943.
- CLEVELAND, R. M., and NEVILLE, L. E. *The Coming Air Age*. New York: McGraw-Hill Book Co., 1944.
- COOPER, JOHN C. *The Right to Fly*. New York: Henry Holt & Co., 1947.
- CRUMP, I., and MAUL, N. *Our Airliners*. New York: Dodd, Mead & Co., 1940.
- DAVID, PAUL T. *The Economics of Air Mail Transportation*. Washington, D.C.: Brookings Institution, 1934.
- DAVIES, W. W. *Cargo Aircraft*. New York: Pitman Publishing Corp., 1946.
- DENE, SHAFTO. *Trail Blazing in the Skies*. Akron: Goodyear Tire & Rubber Co., 1943.
- DODD, P. A. *Financial Policies in the Aviation Industry*. Philadelphia: Westbrook Publishing Co., 1933.
- DUNN, R. A. *Aviation and Life Insurance*. New York: Daniel Guggenheim Fund, 1930.
- DYKSTRA, G. O., and DYKSTRA, L. G. *The Business Law of Aviation*. New York: McGraw-Hill Book Co., 1946.
- ENGLEHARDT, N. L., JR. *Toward New Frontiers of Our Global World*. New York: Noble and Noble Publishers, Inc., 1943.
- FIXEL, R. W. *The Law of Aviation*. Charlottesville: Michie Co., 1945.
- FOLLETT, B. B. *Careers in Aviation*. Boston: Waverly House, 1940.
- FRANCIS, DEVON. *The Story of the Helicopter*. New York: Coward-McCann, Inc., 1946.
- FREDERICK, JOHN H. *Commercial Air Transportation*. 3rd ed. Chicago: Richard D. Irwin, Inc., 1951.
- FREDERICK, JOHN H. *Airport Management*. Chicago: Richard D. Irwin, Inc., 1949.
- FREUDENTHAL, E. E. *The Aviation Business from Kitty Hawk to Wall St.* New York: Vanguard Press, 1940.
- GANN, E. K. *Sky Roads*. New York: Thomas Y. Crowell Co., 1940.
- GILBERT, GLENN A. *Air Traffic Control*. Chicago: Ziff-Davis Publishing Co., 1945.
- GILL, F. W., and BATES, G. L. *Airline Competition*. Cambridge, Mass.: Harvard University, 1949.
- GLIDDEN, H. K.; LAW, H. V.; and COWLES, J. E. *Airports: Design, Construction and Management*. New York: McGraw-Hill Book Co., 1946.
- GOODMAN, GILBERT. *Government Policy toward Commercial Aviation*. New York: Kings Crown Press, 1944.
- GROSSMAN, W. L. *Surface Carrier Participation in Air Transportation*.

- New York: School of Commerce, Accounts and Finance, New York University, 1944.
- GROSSMAN, W. L. *Air Passenger Traffic*. Brooklyn: Chemical Publishing Co., 1947.
- HAGES, ROBERT E. *Jet Propulsion in Commercial Air Transportation*. Princeton: Princeton University Press, 1948.
- HAITSMA, W. V. *Handbook of Aeronautical Vocations*. Zeeland, Mich.: Zeeland Record Co., 1939.
- HANKS, S. S. *Aviation Gets Down to Earth*. Boston: Aviation Information Service, 1940.
- HEINMULLER, J. P. V. *Man's Fight to Fly*. New York: Funk & Wagnalls Co., 1944.
- HENRY, J. FRED. *Your Future in Aviation*. New York: Prentice-Hall, Inc., 1945.
- HERSHEY, B. *The Air Future*. New York: Duell, Sloan and Pearce, 1943.
- HINKELL, R. E., and BARON, LEO. *An Educational Guide in Air Transportation*. Kansas City: Brown-White-Lowell Press, 1944.
- HUGHES, ARTHUR J. *History of Air Navigation*. London: George Allen and Unwin, Ltd., 1946.
- HUNSAKER, JEROME C. *Aeronautics at the Mid-Century*. New Haven: Yale University Press, 1952.
- JOHNSTON, S. P. *Horizons Unlimited*. New York: Duell, Sloan and Pearce, 1941.
- JOHNSTON, S. P. *Wings after War: The Prospects of Post-War Aviation*. New York: Duell, Sloan and Pearce, 1944.
- JOSEPHSON, M. *Empire of the Air: Juan Trippe and the Struggle for World Airways*. New York: Harcourt, Brace & Co., 1944.
- JORDANOFF, A. *Illustrated Aviation Dictionary*. New York: Harper & Bros., 1944.
- KENNEDY, T. H. *An Introduction to the Economics of Air Transportation*. New York: Macmillan Co., 1924.
- KNOWLTON, HUGH. *Air Transportation in the United States*. Chicago: University of Chicago Press, 1941.
- KROPF, GENE. *Airline Traffic Procedures*. New York: McGraw-Hill Book Co., 1949.
- LA FARCE, OLIVER. *The Eagle in the Egg*. Boston: Houghton Mifflin Co., 1949.
- LARSEN, S. E. *Air Cargo Potential in Fresh Fruits and Vegetables*. Detroit: Wayne University Press, 1944.
- LARSEN, S. A.; REITZ, W.; and BURGUM, K. K. *Markets for Airborne Seafoods*. Detroit: Wayne University Press, 1948.
- LEDERER, J. *Safety in the Operation of Air Transportation*. Northfield, Vt.: Norwich University, 1939.
- LEYSON, BURR W. *Wings around the World*. New York: E. P. Dutton Co., 1948.
- LINDHOLM, R. W. *Public Finance of Air Transportation*. Columbus: Ohio State University, 1948.
- LISSITZYN, O. J. *International Air Transport and National Policy*. New York: Council on Foreign Relations, 1942.

- MACAULEY, C. B. F. *The Helicopters Are Coming*. New York: McGraw-Hill Book Co., 1944.
- MACLEOD, N. T. *Air Transportation Costing*. New York: Pitman Publishing Corp., 1937.
- MALKIN, RICHARD. *Boxcars in the Sky*. New York: Import Publications, Inc., 1951.
- MCDONALD, B. A., and DREW, J. L. *Air Transportation in the Immediate Post-War Period*. Buffalo: Curtiss-Wright Corp., 1944.
- McFARLAND, ROSS A. *Human Factors in Air Transport Design*. New York: McGraw-Hill Book Co., 1946.
- MANCE, O., and WHEELER, J. E. *International Air Transport*. New York: Oxford University Press, 1943.
- MEYER, D. *Needed—Women in Aviation*. New York: Robert M. McBride & Co., 1942.
- MILBANK, J., JR. *The First Century of Flight in America*. Princeton: Princeton University Press, 1943.
- NICHOLSON, JOSEPH L. *Air Transport Management*. New York: John Wiley & Sons, Inc., 1951.
- NOEL-BROWN, S. J. *Economics of Air Transport*. New York: Pitman Publishing Corp., 1937.
- NORCROSS, C. *Getting a Job in Aviation*. New York: McGraw-Hill Book Co., 1937.
- OATES, N. S. *Outlook for Air Cargo in Fresh Produce*. Detroit: Wayne University Press, 1944.
- OGBURN, WILLIAM F. *The Social Effects of Aviation*. Boston: Houghton Mifflin Co., 1946.
- PUFFER, C. E. *Air Transportation*. Philadelphia: Blakiston Co., 1941.
- PUTNAM, CARLETON. *High Journey*. New York: Charles Scribner's Sons, 1945.
- RANDERS-PEHRSON, N. H. *History of Aviation*. New York: National Aeronautics Council, Inc., 1944.
- RHYNE, C. S. *Civil Aeronautics Act Annotated*. Washington, D.C.: National Law Book Co., 1939.
- RHYNE, C. S. *Airports and the Courts*. Washington, D.C.: National Law Book Co., 1944.
- RHYNE, C. S. *Aviation Accident Law*. Washington, D.C.: Columbia Law Book Co., 1947.
- RHYNE, C. S. *Airport Lease and Concession Agreements*. Washington, D.C.: National Association Municipal Law Officers, 1948.
- SHAWCROSS, C. N., and BEAUMONT, K. M. *Air Law*. London: Butterworth & Co., 1945.
- SMITH, H. L. *Airways: The History of Commercial Aviation in the United States*. New York: Alfred A. Knopf, 1942.
- SMITH, H. L. *Airways Abroad*. Madison: University of Wisconsin Press, 1950.
- SMITH, S. B. *Air Transport in the Pacific Area*. New York: International Institute of Pacific Relations, 1941.
- SMITH, W. L. *Air Transport Operation*. New York: McGraw-Hill Book Co., 1931.

- SPEAS, R. DIXON. *Airline Operation*. Washington, D.C.: American Aviation Publications, 1948.
- SPENCER, F. A. *Air Mail Payment and the Government*. Washington, D.C.: Brookings Institution, 1941.
- STEWART, D. MURRAY. *Aviation Insurance*. New York: Underwriter Printing and Publishing Co., 1946.
- STUART, F. S., and BAIRD, H. C. *Modern Air Transport*. London: John Long, Ltd., n.d.
- VAN ZANDT, J. PARKER. *Civil Aviation and Peace*. Washington, D.C.: Brookings Institution, 1944.
- VAN ZANDT, J. PARKER. *The Geography of World Air Transport*. Washington, D.C.: Brookings Institution, 1944.
- VAN ZANDT, J. PARKER. *The Chicago Aviation Conference*. New York: Foreign Policy Association, 1945.
- WALDO, RICHARD K. *Post-War Air Transport Costs and Markets for Lettuce*. Chicago: Rand McNally & Co., 1944.
- WALKER, J. B. *How to Get into Aviation*. New York: Random House, Inc., 1940.
- WARNER, E. P. *The Early History of Air Transportation*. Northfield, Vt.: Norwich University, 1937.
- WARNER, E. P. *Technical Development and Its Effect on Air Transportation*. Northfield, Vt.: Norwich University, 1938.
- WILLIS, P. P. *Your Future Is in the Air*. New York: Prentice-Hall, Inc., 1940.
- WILSON, EUGENE E. *Air Power for Peace*. New York: McGraw-Hill Book Co., 1945.
- WILSON, G. L., and BRYAN, L. A. *Air Transportation*. New York: Prentice-Hall, Inc., 1949.
- WOLFE, T. *Air Transportation, Traffic and Management*. New York: McGraw-Hill Book Co., Inc., 1950.
- WOOD, J. W. *Airports*. New York: Coward-McCann, Inc., 1940.
- WOOD, J. W. *Airports and Air Traffic*. New York: Coward-McCann, Inc., 1949.
- WORTHINGTON, A. *International Airways*. New York: H. W. Wilson Co., 1945.
- ZACHAROFF, L. *Vital Problems of Air Commerce*. New York: Duell, Sloan and Pearce, 1946.
- ZACHAROFF, L. *The World's Wings*. New York: Duell, Sloan and Pearce, 1946.
- ZWENG, CHARLES A. *Encyclopedic Aviation Dictionary*. Los Angeles: Wolfer Printing Co., 1944.

Appendix

A * THE CIVIL AERONAUTICS ACT OF 1938 AS AMENDED

THE following is a partial digest of the Civil Aeronautics Act of 1938 as amended. For the convenience of the reader, certain sections are reproduced in full, particularly those discussed in the text. Other sections are digested.

TITLE I—GENERAL PROVISIONS

DEFINITIONS

SECTION 1 [52 Stat. 977, 49 U.S.C. 401] As used in this Act, unless the context otherwise requires—

- (1) "Aeronautics" means the science and art of flight.
- (2) "Air carrier" means any citizen of the United States who undertakes, whether directly or indirectly or by a lease or any other arrangement, to engage in air transportation: *Provided*, That the Authority may by order relieve air carriers who are not directly engaged in the operation of aircraft in air transportation from the provisions of this Act to the extent and for such periods as may be in the public interest.
- (3) "Air commerce" means interstate, overseas, or foreign air commerce or the transportation of mail by aircraft or any operation or navigation of aircraft within the limits of any civil airway or any operation or navigation of aircraft which directly affects, or which may endanger safety in, interstate, overseas, or foreign air commerce.
- (4) "Aircraft" means any contrivance now known or hereafter invented, used, or designed for navigation of or flight in the air.
- (5) "Aircraft engine" means an engine used, or intended to be used, for propulsion of aircraft and includes all parts, appurtenances, and accessories thereof other than propellers.
- (6) "Airman" means any individual who engages, as the person in command or as pilot, mechanic, or member of the crew, in the navigation of aircraft while under way; and (except to the extent the Board may otherwise provide with respect to individuals employed outside the United States) any individual who is directly in charge of the inspection, maintenance, overhauling, or repair of aircraft, aircraft engines, propellers, or appliances; and any

individual who serves in the capacity of aircraft dispatcher or air-traffic control-tower operator.

(7) "Air navigation facility" means any facility used in, available for use in, or designed for use in, aid of air navigation, including landing areas, lights, any apparatus or equipment for disseminating weather information, for signaling, for radio-directional finding, or for radio or other electrical communication, and any other structure or mechanism having a similar purpose for guiding or controlling flight in the air or the landing and take-off of aircraft.

(8) "Airport" means a landing area used regularly by aircraft for receiving or discharging passengers or cargo.

(9) "Air-space reservation" means air space, identified by an area on the surface of the earth, in which the flight of aircraft is prohibited or restricted.

(10) "Air transportation" means interstate, overseas, or foreign air transportation or the transportation of mail by aircraft.

(11) "Appliances" means instruments, equipment, apparatus, parts, appurtenances, or accessories, of whatever description, which are used, or are capable of being or intended to be used, in the navigation, operation, or control of aircraft in flight (including parachutes and including communication equipment and any other mechanism or mechanisms installed in or attached to aircraft during flight), and which are not a part or parts of aircraft, aircraft engines, or propellers.

(12) "Board" means the Civil Aeronautics Board.

(13) "Citizen of the United States" means (a) an individual who is a citizen of the United States or one of its possessions, or (b) a partnership of which each member is such an individual, or (c) a corporation or association created or organized under the laws of the United States or of any State, Territory, or possession of the United States, of which the president and two-thirds or more of the board of directors and other managing officers thereof are such individuals and in which at least 75 per centum of the voting interest is owned or controlled by persons who are citizens of the United States or of one of its possessions.

(14) "Civil aircraft" means any aircraft other than a public aircraft.

(15) "Civil aircraft of the United States" means any aircraft registered as provided in this Act.

(16) "Civil airway" means a path through the navigable air space of the United States, identified by an area on the surface of the earth, designated or approved by the Administrator as suitable for interstate, overseas, or foreign air commerce.

(17) "Conditional sale" means (a) any contract for the sale of an aircraft, engine, propeller, appliance, or spare part under which possession is delivered to the buyer and the property is to vest in the buyer at a subsequent time, upon the payment of part or all of the price, or upon the performance of any other condition or the happening of any contingency; or (b) any contract for the bailment or leasing of an aircraft, aircraft engine, propeller, appliance, or spare part, by which the bailee or lessee contracts to pay as compensation a sum substantially equivalent to the value thereof, and by which it is agreed that the bailee or lessee is bound to become, or has the option of becoming, the

owner thereof upon full compliance with the terms of the contract. The buyer, bailee, or lessee shall be deemed to be the person by whom any such contract is made or given.

(18) "Conveyance" means a bill of sale, contract of conditional sale, mortgage, assignment of mortgage, or other instrument affecting title to, or interest in, property.

(19) "Foreign air carrier" means any person, not a citizen of the United States, who undertakes, whether directly or indirectly or by a lease or any other arrangement, to engage in foreign air transportation.

(20) "Interstate air commerce," "overseas air commerce," and "foreign air commerce," respectively, mean the carriage by aircraft of persons or property for compensation or hire, or the carriage of mail by aircraft, or the operation or navigation of aircraft in the conduct or furtherance of a business or vocation, in commerce between, respectively—

(a) a place in any State of the United States, or the District of Columbia, and a place in any other State of the United States, or the District of Columbia; or between places in the same State of the United States through the air space over any place outside thereof; or between places in the same Territory or possession of the United States, or the District of Columbia;

(b) a place in any State of the United States, or the District of Columbia, and any place in a Territory or possession of the United States; or between a place in a Territory or possession of the United States, and a place in any other Territory or possession of the United States; and

(c) a place in the United States and any place outside thereof, whether such commerce moves wholly by aircraft or partly by aircraft and partly by other forms of transportation.

(21) "Interstate air transportation," "overseas air transportation," and "foreign air transportation," respectively, mean the carriage by aircraft of persons or property as a common carrier for compensation or hire or the carriage of mail by aircraft, in commerce between, respectively—

(a) a place in any State of the United States, or the District of Columbia, and a place in any other State of the United States, or the District of Columbia; or between places in the same State of the United States through the air space over any place outside thereof; or between places in the same Territory or possession of the United States, or the District of Columbia;

(b) a place in any State of the United States, or the District of Columbia, and any place in a Territory or possession of the United States; or between a place in a Territory or possession of the United States, and a place in any other Territory or possession of the United States; and

(c) a place in the United States and any place outside thereof, whether such commerce moves wholly by aircraft or partly by aircraft and partly by other forms of transportation.

(22) "Landing area" means any locality, either of land or water, including airports and intermediate landing fields, which is used, or intended to be used, for the landing and take-off of aircraft, whether or not facilities are provided for the shelter, servicing, or repair of aircraft, or for receiving or discharging passengers or cargo.

(23) "Mail" means United States mail and foreign-transit mail.

(24) "Navigable air space" means air space above the minimum altitudes of flight prescribed by regulations issued under this Act.

(25) "Navigation of aircraft" or "navigate aircraft" includes the piloting of aircraft.

(26) "Operation of aircraft" or "operate aircraft" means the use of aircraft, for the purpose of air navigation and includes the navigation of aircraft. Any person who causes or authorizes the operation of aircraft, whether with or without the right of legal control (in the capacity of owner, lessee, or otherwise) of the aircraft, shall be deemed to be engaged in the operation of aircraft within the meaning of this Act.

(27) "Person" means any individual, firm, copartnership, corporation, company, association, joint-stock association, or body politic; and includes any trustee, receiver, assignee, or other similar representative thereof.

(28) "Propeller" includes all parts, appurtenances, and accessories thereof.

(29) "Possessions of the United States" means (a) Puerto Rico, notwithstanding the provisions of the Act of March 2, 1917, entitled "An Act to provide a civil government for Porto Rico," and any other Act or Acts which are inconsistent with the provisions of this Act; (b) the Canal Zone, but nothing herein shall impair or affect the jurisdiction which has heretofore been, or may hereafter be, granted to the President in respect of air navigation in the Canal Zone; (c) all other possessions of the United States.

(30) "Public aircraft" means an aircraft used exclusively in the service of any government or of any political subdivision thereof, including the government of any State, Territory, or possession of the United States, or the District of Columbia, but not including any government-owned aircraft engaged in carrying persons or property for commercial purposes.

(31) "Spare parts" means parts, appurtenances, and accessories of aircraft (other than aircraft engines and propellers), of aircraft engines (other than propellers), of propellers and of appliances, maintained for installation or use in an aircraft, aircraft engine, propeller, or appliance, but which at the time are not installed therein or attached thereto.

(32) "Ticket agent" means any person, not an air carrier or a foreign air carrier and not a bona-fide employee of an air carrier or foreign air carrier, who, as principal or agent, sells or offers for sale any air transportation, or negotiates for, or holds himself out by solicitation, advertisement, or otherwise as one who sells, provides, furnishes, contracts or arranges for, such transportation.

(33) "United States" means the several States, the District of Columbia, and the several Territories and possessions of the United States, including the Territorial waters and the overlying air space thereof.

DECLARATION OF POLICY

SECTION 2 In the exercise and performance of its powers and duties under this Act, the Board shall consider the following, among other things, as being in the public interest, and in accordance with the public convenience and necessity—

(a) The encouragement and development of an air-transportation system properly adapted to the present and future needs of the foreign and domestic

commerce of the United States, of the Postal Service, and of the national defense;

(b) The regulation of air transportation in such manner as to recognize and preserve the inherent advantages of, assure the highest degree of safety in, and foster sound economic conditions in, such transportation, and to improve the relations between, and coordinate transportation by, air carriers.

(c) The promotion of adequate, economical, and efficient service by air carriers at reasonable charges, without unjust discriminations, undue preferences or advantages, or unfair or destructive competitive practices;

(d) Competition to the extent necessary to assure the sound development of an air-transportation system properly adapted to the needs of the foreign and domestic commerce of the United States, of the Postal Service, and of the national defense;

(e) The regulation of air commerce in such a manner as to best promote its development and safety; and

(f) The encouragement and development of civil aeronautics.

PUBLIC RIGHT OF TRANSIT

SECTION 3 There is hereby recognized and declared to exist in behalf of any citizen of the United States a public right of freedom of transit in air commerce through the navigable air space of the United States.

TITLE II—ORGANIZATION OF BOARD

Composed of five members appointed by President with advice and consent of the Senate. Terms are for six years, but are staggered so that there is one replacement every year from 1940 on. Members may be removed by the President for inefficiency, neglect of duty, or malfeasance in office. The President shall annually designate a chairman and a vice-chairman. Not more than three members may be from the same political party.

Also there shall be an Administrator of Civil Aeronautics similarly appointed by the President. Neither he nor any member may own any stocks or bonds or have any pecuniary interest in any civil aeronautics enterprise.

The Board is empowered to perform any acts, conduct any investigation, and issue any regulations necessary to perform its duties under the Act. It may transmit recommendations for additional legislation.

(Under Reorganization Plans Nos. III and IV of 1940 the Civil Aeronautics Authority and its functions, the Office of the Administrator of Civil Aeronautics and its functions, and the functions of the Air Safety Board were transferred to the Department of Commerce and became the Civil Aeronautics Administration.)

TITLE III—POWERS AND DUTIES OF ADMINISTRATOR

Encourage development of civil aeronautics and air commerce in the U.S. and abroad and establishment of civil airways, landing areas, and other air navigation facilities. Within the limits of available appropriations made by Congress, the Administrator is empowered to acquire and operate air naviga-

tion facilities along any civil airways which he may designate and establish, and he may also provide the necessary personnel etc. for the regulation and protection of air traffic. No exclusive rights to be granted for the use of any civil airway, etc.

Non-military federal funds may only be expended on those landing areas or air navigation facilities which the Administrator recommends as being in the interest of air commerce or national defense. He is directed to make plans for the development of landing areas etc. in the interests of civil aeronautics. He may undertake or supervise development work on air navigation facilities, aircraft, engines, propellers, and appliances and may purchase any of them.

TITLE IV—AIR CARRIER ECONOMIC REGULATION

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

Certificate Required

SECTION 401 (a) No air carrier shall engage in any air transportation unless there is in force a certificate issued by the Board authorizing such air carrier to engage in such transportation: *Provided*, That if an air carrier is engaged in such transportation on the date of the enactment of this Act, such air carrier may continue so to engage between the same terminal and intermediate points for one hundred and twenty days after said date, and thereafter until such time as the Board shall pass upon an application for a certificate for such transportation if within said one hundred and twenty days such air carrier files such application as provided herein.

Application for Certificate

(b) Application for a certificate shall be made in writing to the Board and shall be so verified, shall be in such form and contain such information, and shall be accompanied by such proof of service upon such interested persons, as the Board shall by regulation require.

Notice of Application

(c) Upon the filing of any such application, the Board shall give due notice thereof to the public by posting a notice of such application in the office of the secretary of the Board and to such other persons as the Board may by regulation determine. Any interested person may file with the Board a protest or memorandum of opposition to or in support of the issuance of a certificate. Such application shall be set for public hearing, and the Board shall dispose of such application as speedily as possible.

Issuance of Certificate

(d) (1) The Board shall issue a certificate authorizing the whole or any part of the transportation covered by the application, if it finds that the applicant is fit, willing, and able to perform such transportation properly, and to conform to the provisions of this Act and the rules, regulations, and requirements of the Board hereunder, and that such transportation is required by the public convenience and necessity; otherwise such application shall be denied.

(2) In the case of an application for a certificate to engage in temporary

air transportation, the Board may issue a certificate authorizing the whole or any part thereof for such limited periods as may be required by the public convenience and necessity, if it finds that the applicant is fit, willing, and able properly to perform such transportation and to conform to the provisions of this Act and the rules, regulations, and requirements of the Board hereunder.

Existing Air Carriers

(e) (1) If any applicant who makes application for a certificate within one hundred and twenty days after the date of enactment of this Act shall show that, from May 14, 1938, until the effective date of this section, it, or its predecessor in interest, was an air carrier, continuously operating as such (except as to interruptions of service over which the applicant or its predecessor in interest had no control), the Board, upon proof of such fact only, shall, unless the service rendered by such applicant for such period was inadequate and inefficient, issue a certificate or certificates, authorizing such applicant to engage in air transportation (A) with respect to all classes of traffic for which authorization is sought, except mail, between the terminal and intermediate points between which it, or its predecessor, so continuously operated between May 18, 1938, and the effective date of this section, and (B) with respect to mail and all other classes of traffic for which authorization is sought, between the terminal and intermediate points between which the applicant or its predecessor was authorized by the Postmaster General prior to the effective date of this section, to engage in the transportation of mail: *Provided*, That no applicant holding an air-mail contract shall receive a certificate authorizing it to serve any point not named in such contract as awarded to it and not served by it prior to April 1, 1938, if any other air carrier competitively serving the same point under authority of a contract as awarded to such air carrier shall prove that it is adversely affected thereby, and if the Board shall also find that transportation by the applicant to and from such point is not required by the public convenience and necessity.

(2) If paragraph (1) of this subsection does not authorize the issuance of a certificate authorizing the transportation of mail between each of the points between which air-mail service was provided for by the Act of Congress making appropriations for the Treasury Department and the Post Office Department, approved March 28, 1938, the Board shall, notwithstanding any other provision of this Act, issue certificates authorizing the transportation of mail, and all other classes of traffic for which authorization is sought, between such points, namely, (A) from Wichita, Kansas, to Pueblo, Colorado, via intermediate cities; (B) from Bismarck, North Dakota, to Minot, North Dakota; (C) from Detroit, Michigan, to Sault Sainte Marie, Michigan, via intermediate cities; (D) from Brownsville, Texas, via Corpus Christi, to Houston to San Antonio, Texas; (E) from Phoenix, Arizona, to Las Vegas, Nevada, via intermediate cities; (F) from Jacksonville, Florida, to New Orleans, Louisiana, via intermediate cities; (G) from Tampa, Florida, to Memphis, Tennessee, via intermediate cities, and from Tampa, Florida, to Atlanta, Georgia, via intermediate cities (which projects have been advertised); and (H) by extension from Yakima, Washington, to Portland, Oregon; and (I) by extension from Grand Rapids, Michigan, to Chicago, Illinois.

Terms and Conditions of Certificate

(f) Each certificate issued under this section shall specify the terminal points and intermediate points, if any, between which the air carrier is authorized to engage in air transportation and the service to be rendered; and there shall be attached to the exercise of the privileges granted by the certificate, or amendment thereto, such reasonable terms, conditions, and limitations as the public interest may require. A certificate issued under this section to engage in foreign air transportation shall, insofar as the operation is to take place without the United States, designate the terminal and intermediate points only insofar as the Authority shall deem practicable, and otherwise shall designate only the general route or routes to be followed. Any air carrier holding a certificate for foreign air transportation shall be authorized to handle and transport mail of countries other than the United States. No term, condition, or limitation of a certificate shall restrict the right of an air carrier to add to or change schedules, equipment, accommodations, and facilities for performing the authorized transportation and service as the development of the business and the demands of the public shall require. No air carrier shall be deemed to have violated any term, condition, or limitation of its certificate by landing or taking off during an emergency at a point not named in its certificate or by operating in an emergency, under regulations which may be prescribed by the Board, between terminal and intermediate points other than those specified in its certificate. Any air carrier may make charter trips or perform any other special service, without regard to the points named in its certificate, under regulations prescribed by the Board.

Effective Date and Duration of Certificate

(g) Each certificate shall be effective from the date specified therein, and shall continue in effect until suspended or revoked as hereinafter provided, or until the Board shall certify that operation thereunder has ceased, or, if issued for a limited period of time under subsection (d) (2) of this section, shall continue in effect until the expiration thereof, unless, prior to the date of expiration, such certificate shall be suspended or revoked as provided herein, or the Board shall certify that operations thereunder have ceased: *Provided*, That if any service authorized by a certificate is not inaugurated within such period, not less than ninety days, after the date of the authorization as shall be fixed by the Board, or if, for a period of ninety days or such other period as may be designated by the Board, any such service is not operated, the Board may by order, entered after notice and hearing, direct that such certificate shall thereupon cease to be effective to the extent of such service.

Authority to Modify, Suspend, or Revoke

(h) The Board, upon petition or complaint or upon its own initiative, after notice and hearing, may alter, amend, modify, or suspend any such certificate, in whole or in part, if the public convenience and necessity so require, or may revoke any such certificate, in whole or in part, for intentional failure to comply with any provision of this title or any order, rule, or regulation issued hereunder or any term, condition, or limitation of such certificate: *Provided*, That no such certificate shall be revoked unless the holder thereof fails to com-

ply, within a reasonable time to be fixed by the Board, with an order of the Board commanding obedience to the provision, or to the order (other than an order issued in accordance with this proviso), rule, regulation, term, condition, or limitation found by the Board to have been violated. Any interested person may file with the Board a protest or memorandum in support of or in opposition to the alteration, amendment, modification, suspension, or revocation of a certificate.

Transfer of Certificate

(i) No certificate may be transferred unless such transfer is approved by the Board as being consistent with the public interest.

Certain Rights Not Conferred by Certificate

(j) No certificate shall confer any proprietary, property, or exclusive right in the use of any air space, civil airway, landing area, or air-navigation facility.

Application for Abandonment

(k) No air carrier shall abandon any route, or part thereof, for which a certificate has been issued by the Board, unless, upon the application of such air carrier, after notice and hearing, the Board shall find such abandonment to be in the public interest. Any interested person may file with the Board a protest or memorandum of opposition to or in support of any such abandonment. The Board may, by regulations or otherwise, authorize such temporary suspension of service as may be in the public interest.

Compliance With Labor Legislation

(1) (1) Every air carrier shall maintain rates of compensation, maximum hours, and other working conditions and relations of all of its pilots and copilots who are engaged in interstate air transportation within the continental United States (not including Alaska) so as to conform with decision numbered 83 made by the National Labor Board on May 10, 1934, notwithstanding any limitation therein as to the period of its effectiveness.

(2) Every air carrier shall maintain rates of compensation for all of its pilots and copilots who are engaged in overseas or foreign air transportation or air transportation wholly within a Territory or possession of the United States, the minimum of which shall be not less, upon an annual basis, than the compensation required to be paid under said decision 83 for comparable service to pilots and copilots engaged in interstate air transportation within the continental United States (not including Alaska).

(3) Nothing herein contained shall be construed as restricting the right of any such pilots or copilots, or other employees, of any such air carrier to obtain by collective bargaining higher rates of compensation or more favorable working conditions or relations.

(4) It shall be a condition upon the holding of a certificate by any air carrier that such carrier shall comply with title II of the Railway Labor Act, as amended.

(5) The term "pilot" as used in this subsection shall mean an employee who is responsible for the manipulation of or who manipulates the flight controls of an aircraft while under way including take-off and landing of such

aircraft, and the term "copilot" as used in this subsection shall mean an employee any part of whose duty is to assist or relieve the pilot in such manipulation, and who is properly qualified to serve as, and holds a currently effective airman certificate authorizing him to serve as, such pilot or copilot.

Requirement as to Carriage of Mail

(m) Whenever so authorized by its certificate, any air carrier shall provide necessary and adequate facilities and service for the transportation of mail, and shall transport mail whenever required by the Postmaster General. Such air carrier shall be entitled to receive reasonable compensation therefor as hereinafter provided.

Application for New Mail Service

(n) Whenever, from time to time, the Postmaster General shall find that the needs of the Postal Service require the transportation of mail by aircraft between any points within the United States or between the United States and foreign countries, in addition to the transportation of mail authorized in certificates then currently effective, the Postmaster General shall certify such finding to the Board and file therewith a statement showing such additional service and the facilities necessary in connection therewith, and a copy of such certificate and statement shall be posted for at least twenty days in the office of the secretary of the Board. The Board shall, after notice and hearing, and if found by it to be required by the public convenience and necessity, make provision for such additional service, and the facilities necessary in connection therewith, by issuing a new certificate or certificates or by amending an existing certificate or certificates in accordance with the provisions of this section.

PERMITS TO FOREIGN AIR CARRIERS

Permit Required

SECTION 402 (a) No foreign air carrier shall engage in foreign air transportation unless there is in force a permit issued by the Board authorizing such carrier so to engage: *Provided*, That if any foreign air carrier is engaged in such transportation on the date of the enactment of this Act, such carrier may continue so to engage between the same terminal and intermediate points for one hundred and twenty days after said date, and thereafter until such time as the Board shall pass upon an application for a permit for such transportation if within said one hundred and twenty days such carrier files such application as provided in this section.

Issuance of Permit

(b) The Board is empowered to issue such a permit if it finds that such carrier is fit, willing, and able properly to perform such air transportation and to conform to the provisions of this Act and the rules, regulations, and requirements of the Board hereunder, and that such transportation will be in the public interest.

Existing Permits

(c) Any such carrier who holds a permit issued by the Secretary of Commerce under section 6 of the Air Commerce Act of 1926, as amended, which was in effect on May 14, 1938, and which authorizes such carrier to operate between any foreign country and the United States, shall be entitled to receive a permit under this section upon proof of that fact only.

Application for Permit

(d) Application for a permit shall be made in writing to the Board, shall be so verified, shall be in such form and contain such information, and shall be accompanied by such proof of service upon such interested persons, as the Board shall by regulation require.

Notice of Application

(e) Upon the filing of an application for a permit the Board shall give due notice thereof to the public by posting a notice of such application in the office of the secretary of the Board and to such other persons as the Board may by regulation determine. Any interested person may file with the Board a protest or memorandum of opposition to or in support of the issuance of a permit. Such application shall be set for public hearing and the Board shall dispose of such applications as speedily as possible.

Terms and Conditions of Permit

(f) The Board may prescribe the duration of any permit and may attach to such permit such reasonable terms, conditions, or limitations as, in its judgment, the public interest may require.

Authority to Modify, Suspend, or Revoke

(g) Any permit issued under the provisions of this section may, after notice and hearing, be altered, modified, amended, suspended, canceled, or revoked by the Board whenever it finds such action to be in the public interest. Any interested person may file with the Board a protest or memorandum in support of or in opposition to the alteration, modification, amendment, suspension, cancellation, or revocation of a permit.

Transfer of Permit

(h) No permit may be transferred unless such transfer is approved by the Board as being in the public interest.

TARIFFS OF AIR CARRIERS

Filing of Tariffs Required

SECTION 403 (a) Every air carrier and every foreign air carrier shall file with the Board, and print, and keep open to public inspection, tariffs showing all rates, fares, and charges for air transportation between points served by it, and between points served by it and points served by any other air carrier or foreign air carrier when through service and through rates shall have been established, and showing to the extent required by regulations of the Board,

all classifications, rules, regulations, practices, and services in connection with such air transportation. Tariffs shall be filed, posted, and published in such form and manner, and shall contain such information, as the Board shall by regulation prescribe; and the Board is empowered to reject any tariff so filed which is not consistent with this section and such regulations. Any tariff so rejected shall be void. The rates, fares, and charges shown in any tariff shall be stated in terms of lawful money of the United States, but such tariffs may also state rates, fares, and charges in terms of currencies other than lawful money of the United States, and may, in the case of foreign air transportation, contain such information as may be required under the laws of any country in or to which an air carrier or foreign air carrier is authorized to operate.

Observance of Tariffs; Rebating Prohibited

(b) No air carrier or foreign air carrier shall charge or demand or collect or receive a greater or less or different compensation for air transportation, or for any service in connection therewith, than the rates, fares, and charges specified in its currently effective tariffs; and no air carrier or foreign air carrier shall, in any manner or by any device, directly or indirectly, or through any agent or broker, or otherwise, refund or remit any portion of the rates, fares, or charges so specified, or extend to any person any privileges or facilities, with respect to matters required by the Board to be specified in such tariffs, except those specified therein. Nothing in this Act shall prohibit such air carriers or foreign air carriers, under such terms and conditions as the Board may prescribe, from issuing or interchanging tickets or passes for free or reduced-rate transportation to their directors, officers, and employees and their immediate families; witnesses and attorneys attending any legal investigation in which any such air carrier is interested; persons injured in aircraft accidents and physicians and nurses attending such persons; and any person or property with the object of providing relief in cases of general epidemic, pestilence, or other calamitous visitation; and, in the case of overseas or foreign air transportation, to such other persons and under such other circumstances as the Board may by regulations prescribe.

Notice of Tariff Change

(c) No change shall be made in any rate, fare, or charge, or any classification, rule, regulation, or practice affecting such rate, fare, or charge, or the value of the service thereunder, specified in any effective tariff of any air carrier or foreign air carrier, except after thirty days' notice of the proposed change filed, posted, and published in accordance with subsection (a) of this section. Such notice shall plainly state the change proposed to be made and the time such change will take effect. The Board may in the public interest, by regulation or otherwise, allow such change upon notice less than that herein specified, or modify the requirements of this section with respect to filing and posting of tariffs, either in particular instances or by general order applicable to special or peculiar circumstances or conditions.

Filing of Divisions of Rates and Charges Required

(d) Every air carrier or foreign air carrier shall keep currently on file with the Board, if the Board so requires, the established divisions of all joint

rates, fares, and charges for air transportation in which such air carrier or foreign air carrier participates.

RATES FOR CARRIAGE OF PERSONS AND PROPERTY

Carrier's Duty to Provide Service, Rates, and Divisions

SECTION 404 (a) It shall be the duty of every air carrier to provide and furnish interstate and overseas air transportation, as authorized by its certificate, upon reasonable request therefor and to provide reasonable through service in such air transportation in connection with other air carriers; to provide safe and adequate service, equipment, and facilities in connection with such transportation; to establish, observe, and enforce just and reasonable individual and joint rates, fares, and charges, and just and reasonable classifications, rules, regulations, and practices relating to such air transportation; and, in case of such joint rates, fares, and charges, to establish just, reasonable, and equitable divisions thereof as between air carriers participating therein which shall not unduly prefer or prejudice any of such participating air carriers.

Discrimination

(b) No air carrier or foreign air carrier shall make, give, or cause any undue or unreasonable preference or advantage to any particular person, port, locality, or description of traffic in air transportation in any respect whatsoever or subject any particular person, port, locality, or description of traffic in air transportation to any unjust discrimination or any undue or unreasonable prejudice or disadvantage in any respect whatsoever.

Foreign Rate Study

(c) The Board is empowered and directed to investigate and report to the Congress within one year from the effective date of this section, to what extent, if any, the Federal Government should further regulate the rates, fares, and charges of air carriers engaged in foreign air transportation, and the classifications, rules, regulations, and practices affecting such rates, fares or charges.

TRANSPORTATION OF MAIL

Continuation and Termination of Mail Contracts

SECTION 405 (a) Each contract between the United States and any person for the carriage of mail, entered into or continued under the provisions of the Air Mail Act of 1934, as amended, and each contract for the carriage of mail by aircraft in Alaska, shall be continued in effect until canceled in accordance with this subsection. Each such contract shall be canceled upon the issuance to the holder of such contract of a certificate of public convenience and necessity authorizing the transportation of mail by aircraft between the points covered by such contract, or upon the failure of the holder of such contract to apply for such certificate within one hundred and twenty days after the date of enactment of this act, or upon a determination by the Board that such certificate should not be issued. Until the Board fixes rates under section 406 of this Act,

the Postmaster General shall pay compensation for the transportation of mail by aircraft at the rates provided by each such contract or, where rates have been heretofore or shall hereafter be fixed by orders of the Interstate Commerce Commission, pursuant to proceedings instituted prior to the date of enactment of this Act, shall pay compensation for such transportation in accordance with such orders as if this Act had not been enacted.

Continuation and Termination of Foreign Mail Contracts

(b) Each contract between the United States and any person heretofore entered into under the provisions of the Act of March 8, 1928, as amended (45 Stat. 248), shall be continued in effect until canceled in accordance with this subsection. Each such contract shall be canceled upon the issuance of a certificate of public convenience and necessity to the holder of such contract authorizing the transportation of mail by aircraft between the points covered by such contract, or upon the effective date of any order of the Board hereunder fixing a fair and reasonable rate of compensation for the transportation of mail by aircraft between the points covered by such contract, whichever is later, or upon the failure of the holder of such contract to apply for such certificate within one hundred and twenty days after the date of enactment of this Act, or upon a determination by the Board that such certificate should not be issued.

Termination of Bonds

(c) Upon the cancellation, pursuant to the provisions of this Act, of any contract for the transportation of mail by aircraft, the bond or bonds required from the holder thereof shall terminate and cease to be effective, and such holder and his or its surety or sureties thereon shall be released and discharged from all obligations thereunder, and all securities deposited with such bond or bonds shall forthwith be returned to such holder: *Provided*, That the foregoing provision shall not be construed to terminate or make ineffective any bond or bonds of such holder, or to release or discharge from any obligation thereunder such holder or his or its surety or sureties thereon, in respect of any matter arising prior to the date of the cancellation of such contract, and such holder or his or its surety or sureties thereon shall not be released or discharged prior to disposition of any such matter: *Provided further*, That nothing in this Act shall be construed to affect any right which may have accrued to any air carrier prior to the date of the cancellation, pursuant to the provisions of this Act, of any contract for the transportation of mail by aircraft.

Rules and Regulations

(d) The Postmaster General is authorized to make such rules and regulations, not inconsistent with the provisions of this Act, or any order, rule, or regulation made by the Board thereunder, as may be necessary for the safe and expeditious carriage of mail by aircraft.

Mail Schedules

(e) Each air carrier shall, from time to time, file with the Board and the Postmaster General a statement showing the points between which such air

carrier is authorized to engage in air transportation, and all schedules, and all changes therein, of aircraft regularly operated by the carrier between such points, setting forth in respect of each such schedule the points served thereby and the time of arrival and departure at each such point. The Postmaster General may designate any such schedule for the transportation of mail between the points between which the air carrier is authorized by its certificate to transport mail, and may, by order, require the air carrier to establish additional schedules for the transportation of mail between such points. No change shall be made in any schedules designated or ordered to be established by the Postmaster General except upon ten days' notice thereof filed as herein provided. The Postmaster General may by order disapprove any such change or alter, amend, or modify any such schedule or change. No order of the Postmaster General under this subsection shall become effective until ten days after its issuance. Any person who would be aggrieved by any such order of the Postmaster General under this subsection may, before the expiration of such ten-day period, apply to the Board, under such regulations as it may prescribe, for a review of such order. The Board may review, and, if the public convenience and necessity so require, amend, revise, suspend, or cancel such order; and, pending such review and the determination thereof, may postpone the effective date of such order. The Board shall give preference to proceedings under this subsection over all proceedings pending before it. No air carrier shall transport mail in accordance with any schedule other than a schedule designated or ordered to be established under this subsection for the transportation of mail.

Maximum Mail Load

(f) The Board may fix the maximum mail load for any schedule or for any aircraft or any type of aircraft; but, in the event that mail in excess of the maximum load is tendered by the Postmaster General for transportation by any air carrier in accordance with any schedule designated or ordered to be established by the Postmaster General under subsection (e) of this section for the transportation of mail, such air carrier shall, to the extent such air carrier is reasonably able as determined by the Board, furnish facilities sufficient to transport, and shall transport such mail as nearly in accordance with such schedule as the Board shall determine to be possible.

Tender of Mail

(g) From and after the issuance of any certificate authorizing the transportation of mail by aircraft, the Postmaster General shall tender mail to the holder thereof, to the extent required by the Postal Service, for transportation between the points named in such certificate for the transportation of mail, and such mail shall be transported by the air carrier holding such certificate in accordance with such rules, regulations, and requirements as may be promulgated by the Postmaster General under this section.

Foreign Postal Arrangements

(h) (1) Nothing in this Act shall be deemed to abrogate or affect any arrangement made by the United States with the postal administration of any foreign country with respect to transportation of mail by aircraft, or to impair

the authority of the Postmaster General to enter into any such arrangement with the postal administration of any foreign country.

(2) The Postmaster General may, in any case where service may be necessary by a person not a citizen of the United States who may not be obligated to transport the mail for a foreign country, make arrangements, without advertising, with such person for transporting mail by aircraft to or within any foreign country.

Transportation of Foreign Mail

(i) (1) Any air carrier holding a certificate to engage in foreign air transportation and transporting mails of foreign countries shall transport such mails subject to control and regulation by the United States. The Postmaster General shall from time to time fix the rates of compensation that shall be charged the respective foreign countries for the transportation of their mails by such air carriers, and such rates shall be put into effect by the Postmaster General in accordance with the provisions of the postal convention regulating the postal relations between the United States and the respective foreign countries, or as provided hereinafter in this subsection. In any case where the Postmaster General deems such action to be in the public interest, he may approve rates provided in arrangements between any such air carrier and any foreign country covering the transportation of mails of such country, under which mails of such country have been carried on scheduled operations prior to January 1, 1938, or in extensions or modifications of such arrangements, and may permit any such air carrier to enter into arrangements with any foreign country for the transportation of its mails at rates fixed by the Postmaster General in advance of the making of any such arrangement. The Postmaster General may authorize any such air carrier, under such limitations as the Postmaster General may prescribe, to change the rates to be charged any foreign country for the transportation of its mails by such air carrier within that country or between that country and another foreign country.

(2) In any case where such air carrier has an arrangement with any foreign country for transporting its mails, made or approved in accordance with the provisions of subdivision (1) of this subsection, it shall collect its compensation from the foreign country under its arrangement, and in case of the absence of any arrangement between the air carrier and the foreign country consistent with this subsection, the collections made from the foreign country by the United States shall be for the account of such air carrier: *Provided*, That no such air carrier shall be entitled to receive compensation both from such foreign country and from the United States in respect of the transportation of the same mail or the same mails of foreign countries.

(3) In the case of any air carrier holding a contract under the provisions of the Act of March 8, 1928, as amended (45 Stat. 248), providing for the carriage of mails of foreign countries for the account of the United States, this subsection shall apply only upon the cancellation of such contract as provided in this section.

Evidence of Performance of Mail Service

(j) Air carriers transporting or handling United States mail shall submit, under signature of a duly authorized official, when and in such form as may be

required by the Postmaster General, evidence of the performance of mail service: and air carriers transporting or handling mails of foreign countries shall submit, under signature of a duly authorized official, when and in such form as may be required by the Postmaster General, evidence of the amount of such mails transported or handled, and the compensation payable and received therefor.

Emergency Mail Service

(k) In the event of emergency caused by flood, fire, or other calamitous visitation, the Postmaster General is authorized to contract, without advertising, for the transportation by aircraft of any or all classes of mail to or from localities affected by such calamity, where available facilities of persons authorized to transport mail to or from such localities are inadequate to meet the requirements of the Postal Service during such emergency. Such contracts may be only for such periods as may be necessitated, for the maintenance of mail service, by the inadequacy of such other facilities. No operation pursuant to any such contract, for such period, shall be air transportation within the purview of this Act. Payment of compensation for service performed under such contracts shall be made, at rates provided in such contracts, from appropriations for the transportation of mail by the means normally used for transporting the mail transported under such contracts.

Experimental Air-Mail Service

(l) Nothing contained in this Act shall be construed to repeal in whole or in part the provisions of section 6 of the Act entitled "An Act to provide for experimental air-mail service, to further develop safety, efficiency, economy, and for other purposes," approved April 15, 1938. The transportation of mail under contracts entered into under such section shall not, except for sections 401 (1) and 416 (b), be deemed to be "air transportation" as used in this Act, and the rates of compensation for such transportation of mail shall not be fixed under this Act.

Free Travel for Postal Employees

(m) Every air carrier carrying the mails shall carry on any plane that it operates and without charge therefor, the persons in charge of the mails when on duty, and such duly accredited agents and officers of the Post Office Department, and post office inspectors, while traveling on official business relating to the transportation of mail by aircraft, as the Authority may by regulation prescribe, upon the exhibition of their credentials.

RATES FOR TRANSPORTATION OF MAIL

Board to Fix Rates

SECTION 406 (a) The Board is empowered and directed, upon its own initiative or upon petition of the Postmaster General or an air carrier, (1) to fix and determine from time to time, after notice and hearing, the fair and reasonable rates of compensation for the transportation of mail by aircraft, the facilities used and useful therefor, and the services connected therewith (in-

cluding the transportation of mail by an air carrier by other means than aircraft whenever such transportation is incidental to the transportation of mail by aircraft or is made necessary by conditions of emergency arising from aircraft operation), by each holder of a certificate authorizing the transportation of mail by aircraft, and to make such rates effective from such date as it shall determine to be proper; (2) to prescribe the method or methods, by aircraft-mile, pound-mile, weight, space, or any combination thereof, or otherwise, for ascertaining such rates of compensation for each air carrier or class of air carriers; and (3) to publish the same; and the rates so fixed and determined shall be paid by the Postmaster General from appropriations for the transportation of mail by aircraft.

(Under Reorganization Plan No. 10 of 1953 there were transferred to the Civil Aeronautics Board the functions of the Postmaster General with respect to paying to each air carrier so much of the compensation fixed and determined by the Board under section 406 of the Civil Aeronautics Act of 1938, as in excess of the amount payable to such air carrier, under honest, economical, and efficient management, for the transportation of mail by aircraft, at fair and reasonable rates fixed and determined by the Board in accordance with that section and without regard to the following provision of subsection (b) thereof: "the need of each such carrier for compensation for the transportation of mail sufficient to insure the performance of such service, and, together with all other revenue of the air carrier, to enable such air carrier under honest, economical, and efficient management, to maintain and continue the development of air transportation to the extent and of the character and quality required for the commerce of the United States, the Postal Service, and the national defense.")

Rate-Making Elements

(b) In fixing and determining fair and reasonable rates of compensation under this section, the Board, considering the conditions peculiar to transportation by aircraft and to the particular air carrier or class of air carriers, may fix different rates for different air carriers or classes of air carriers, and different classes of service. In determining the rate in each case, the Board shall take into consideration, among other factors, the condition that such air carriers may hold and operate under certificates authorizing the carriage of mail only by providing necessary and adequate facilities and service for the transportation of mail; such standards respecting the character and quality of service to be rendered by air carriers as may be prescribed by or pursuant to law; and the need of each such air carrier for compensation for the transportation of mail sufficient to insure the performance of such service, and, together with all other revenue of the air carrier, to enable such air carrier under honest, economical, and efficient management, to maintain and continue the development of air transportation to the extent and of the character and quality required for the commerce of the United States, the Postal Service, and the national defense.

Statement of Postmaster General and Carrier

(c) Any petition for the fixing of fair and reasonable rates of compensation under this section shall include a statement of the rate the petitioner be-

lieves to be fair and reasonable. The Postmaster General shall introduce as part of the record in all proceedings under this section a comprehensive statement of all service to be required of the air carrier and such other information in his possession as may be deemed by the Board to be material to the inquiry.

Weighing of Mail

(d) The Postmaster General may weigh the mail transported by aircraft and make such computations for statistical and administrative purposes as may be required in the interest of the mail service. The Postmaster General is authorized to employ such clerical and other assistance as may be required in connection with proceedings under this Act. If the Board shall determine that it is necessary or advisable, in order to carry out the provisions of this Act, to have additional and more frequent weighing of the mails, the Postmaster General, upon request of the authority, shall provide therefor in like manner, but such weighing need not be for continuous periods of more than thirty days.

Availability of Appropriations

(e) Except as otherwise provided in section 405 (k), the unexpended balances of all appropriations for the transportation of mail by aircraft pursuant to contracts entered into under the Air Mail Act of 1934, as amended, and the unexpended balances of all appropriations available for the transportation of mail by aircraft in Alaska, shall be available, in addition to the purposes stated in such appropriations, for the payment of compensation by the Postmaster General, as provided in this Act, for the transportation of mail by aircraft, the facilities used and useful therefor, and the services connected therewith, between points in the continental United States or between points in Hawaii or in Alaska or between points in the continental United States and points in Canada within one hundred and fifty miles of the international boundary line. Except as otherwise provided in section 405 (k), the unexpended balances of all appropriations for the transportation of mail by aircraft pursuant to contracts entered into under the Act of March 8, 1928, as amended, shall be available, in addition to the purposes stated in such appropriations, for payment to be made by the Postmaster General, as provided by this Act, in respect of the transportation of mail by aircraft, the facilities used and useful therefor, and the services connected therewith, between points in the United States and points outside thereof, or between points in the continental United States and Territories or possessions of the United States, or between Territories or possessions of the United States.

Payments to Foreign Air Carriers

(f) In any case where air transportation is performed between the United States and any foreign country, both by aircraft owned or operated by one or more air carriers holding a certificate under this title and by air craft owned or operated by one or more foreign air carriers, the Postmaster General shall not pay to or for the account of any such foreign air carrier a rate of compensation for transporting mail by aircraft between the United States and such foreign country, which, in his opinion, will result (over such reasonable period

as the Postmaster General may determine, taking account of exchange fluctuations and other factors) in such foreign air carrier receiving a higher rate of compensation for transporting such mail than such foreign country pays to air carriers for transporting its mail by aircraft between such foreign country and the United States, or receiving a higher rate of compensation for transporting such mail than a rate determined by the Postmaster General to be comparable to the rate such foreign country pays to air carriers for transporting its mail by aircraft between such foreign country and an intermediate country on the route of such air carrier between such foreign country and the United States.

ACCOUNTS, RECORDS, AND REPORTS

Filing of Reports

SECTION 407 (a) The Board is empowered to require annual, monthly, periodical, and special reports from any air carrier; to prescribe the manner and form in which such reports shall be made; and to require from any air carrier specific answers to all questions upon which the Board may deem information to be necessary. Such reports shall be under oath whenever the Board so requires. The Board may also require any air carrier to file with it a true copy of each or any contract, agreement, understanding, or arrangement, between such air carrier and any other carrier or person, in relation to any traffic affected by the provisions of this Act.

Disclosure of Stock Ownership

(b) Each air carrier shall submit annually, and at such other times as the Board shall require, a list showing the names of each of its stockholders or members holding more than 5 per centum of the entire capital stock or capital, as the case may be, of such air carrier, together with the name of any person for whose account, if other than the holder, such stock is held; and a report setting forth a description of the shares of stock, or other interest, held by such air carrier, or for its account, in persons other than itself.

Disclosure of Stock Ownership by Office or Director

(c) Each officer and director of an air carrier shall annually and at such other times as the Board shall require transmit to the Board a report describing the shares of stock or other interests held by him in any air carrier, any person engaged in any phase of aeronautics, or any common carrier, and in any person whose principal business, in purpose or in fact, is the holding of stock in, or control of, air carriers, other persons engaged in any phase of aeronautics, or common carriers.

Form of Accounts

(d) The Board shall prescribe the forms of any and all accounts, records, and memoranda to be kept by air carriers, including the accounts, records, and memoranda of the movement of traffic, as well as of the receipts and expenditures of money, and the length of time such accounts, records, and memoranda shall be preserved; and it shall be unlawful for air carriers to keep any ac-

counts, records, or memoranda other than those prescribed or approved by the Board: *Provided*, That any air carrier may keep additional accounts, records, or memoranda if they do not impair the integrity of the accounts, records, or memoranda prescribed or approved by the Board and do not constitute an undue financial burden on such air carrier.

Inspection of Accounts and Property

(e) The Board shall at all times have access to all lands, buildings, and equipment of any carrier and to all accounts, records, and memoranda, including all documents, papers, and correspondence, now or hereafter existing, and kept or required to be kept by air carriers; and it may employ special agents or auditors, who shall have authority under the orders of the Board to inspect and examine any and all such lands, buildings, equipment, accounts, records, and memoranda. The provisions of this section shall apply, to the extent found by the Board to be reasonably necessary for the administration of this Act, to persons having control over any air carrier, or affiliated with any air carrier within the meaning of section 5 (8) of the Interstate Commerce Act, as amended.

CONSOLIDATION, MERGER, AND ACQUISITION OF CONTROL

Acts Prohibited

SECTION 408 (a) It shall be unlawful unless approved by order of the Board as provided in this section—

(1) For two or more air carriers, or for any air carrier and any other common carrier or any person engaged in any other phase of aeronautics, to consolidate or merge their properties, or any part thereof, into one person for the ownership, management, or operation of the properties theretofore in separate ownerships;

(2) For any air carrier, any person controlling an air carrier, any other common carrier, or any person engaged in any other phase of aeronautics, to purchase, lease or contract to operate the properties, or any substantial part thereof, of any air carrier;

(3) For any air carrier or person controlling an air carrier to purchase, lease, or contract to operate the properties, or any substantial part thereof, of any person engaged in any phase of aeronautics otherwise than as an air carrier;

(4) For any foreign air carrier or person controlling a foreign air carrier to acquire control, in any manner whatsoever, of any citizen of the United States engaged in any phase of aeronautics;

(5) For any air carrier or person controlling an air carrier, any other common carrier, or any person engaged in any other phase of aeronautics, to acquire control of any air carrier in any manner whatsoever;

(6) For any air carrier or person controlling an air carrier to acquire control, in any manner whatsoever, of any person engaged in any phase of aeronautics otherwise than as an air carrier; or

(7) For any person to continue to maintain any relationship established in violation of any of the foregoing subdivisions of this subsection.

Power of the Board

(b) Any person seeking approval of a consolidation, merger, purchase, lease, operating contract, or acquisition of control, specified in subsection (a) of this section, shall present an application to the Board, and thereupon the Board shall notify the persons involved in the consolidation, merger, purchase, lease, operating contract, or acquisition of control, and other persons known to have a substantial interest in the proceeding, of the time and place of a public hearing. Unless, after such hearing, the Board finds that the consolidation, merger, purchase, lease, operating contract, or acquisition of control will not be consistent with the public interest or that the conditions of this section will not be fulfilled, it shall by order, approve such consolidation, merger, purchase, lease, operating contract, or acquisition of control, upon such terms and conditions as it shall find to be just and reasonable and with such modifications as it may prescribe: *Provided*, That the Board shall not approve any consolidation, merger, purchase, lease, operating contract, or acquisition of control which would result in creating a monopoly or monopolies and thereby restrain competition or jeopardize another air carrier not a party to the consolidation, merger, purchase, lease, operating contract, or acquisition of control: *Provided further*, That if the applicant is a carrier other than an air carrier, or a person controlled by a carrier other than an air carrier or affiliated therewith within the meaning of section 5 (8) of the Interstate Commerce Act, as amended, such applicant shall for the purposes of this section be considered an air carrier and the Board shall not enter such an order of approval unless it finds that the transaction proposed will promote the public interest by enabling such carrier other than an air carrier to use aircraft to public advantage in its operation and will not restrain competition.

Interests in Ground Facilities

(c) The provisions of this section and section 409 shall not apply with respect to the acquisition or holding by any air carrier, or any officer or director thereof, of (1) any interest in any ticket office, landing area, hangar, or other ground facility reasonably incidental to the performance by such air carrier of any of its services, or (2) any stock or other interest or any office or directorship in any person whose principal business is the maintenance or operation of any such ticket office, landing area, hangar, or other ground facility.

Jurisdiction of Accounts of Noncarriers

(d) Whenever, after the effective date of this section, a person, not an air carrier, is authorized, pursuant to this section, to acquire control of an air carrier, such person thereafter shall, to the extent found by the Board to be reasonably necessary for the administration of this Act, be subject, in the same manner as if such person were an air carrier, to the provisions of this Act relating to accounts, records, and reports, and the inspection of facilities and records, including the penalties applicable in the case of violations thereof.

Investigation of Violations

(e) The Board is empowered, upon complaint or upon its own initiative, to investigate and, after notice and hearing, to determine whether any person is violating any provision of subsection (a) of this section. If the Board finds

after such hearing that such person is violating any provision of such subsection, it shall by order require such person to take such action, consistent with the provisions of this Act, as may be necessary, in the opinion of the Authority, to prevent further violation of such provision.

PROHIBITED INTERESTS

Interlocking Relationships

SECTION 409 (a) After one hundred and eighty days after the effective date of this section, it shall be unlawful, unless such relationship shall have been approved by order of the Board upon due showing, in the form and manner prescribed by the Board, that the public interest will not be adversely affected thereby—

(1) For any air carrier to have and retain an officer or director who is an officer, director, or member, or who as a stockholder holds a controlling interest, in any other person who is a common carrier or is engaged in any phase of aeronautics.

(2) For any air carrier, knowingly and willfully, to have and retain an officer or director who has a representative or nominee who represents such officer or director as an officer, director, or member, or as a stockholder holding a controlling interest, in any other person who is a common carrier or is engaged in any phase of aeronautics.

(3) For any person who is an officer or director of an air carrier to hold the position of officer, director, or member, or to be a stockholder holding a controlling interest, or to have a representative or nominee who represents such person as an officer, director, or member, or as a stockholder holding a controlling interest, in any other person who is a common carrier or is engaged in any phase of aeronautics.

(4) For any air carrier to have and retain an officer or director who is an officer, director, or member, or who as a stockholder holds a controlling interest, in any person whose principal business, in purpose or in fact, is the holding of stock in, or control of, any other person engaged in any phase of aeronautics.

(5) For any air carrier, knowingly and willfully, to have and retain an officer or director who has a representative or nominee who represents such officer or director as an officer, director, or member or as a stockholder holding a controlling interest, in any person whose principal business, in purpose or in fact, is the holding of stock in, or control of, any other person engaged in any phase of aeronautics.

(6) For any person who is an officer or director of an air carrier to hold the position of officer, director, or member, or to be a stockholder holding a controlling interest, or to have a representative or nominee who represents such person as an officer, director, or member, or as a stockholder holding a controlling interest, in any person whose principal business, in purpose or in fact, is the holding of stock in, or control of, any other person engaged in any phase of aeronautics.

Profit From Transfer of Securities

(b) After this section takes effect it shall be unlawful for any officer or director of any air carrier to receive for his own benefit, directly or indirectly,

any money or thing of value in respect of negotiation, hypothecation, or sale of any securities issued or to be issued by such carrier, or to share in any of the proceeds thereof.

LOANS AND FINANCIAL AID

SECTION 410 The Board is empowered to approve or disapprove, in whole or in part, any and all applications made after the effective date of this section for or in connection with any loan or other financial aid from the United States or any agency thereof to, or for the benefit of, any air carrier. No such loan or financial aid shall be made or given without such approval, and the terms and conditions upon which such loan or financial aid is provided shall be prescribed by the Board.

METHODS OF COMPETITION

SECTION 411 The Board may, upon its own initiative or upon complaint by any carrier or foreign air carrier, if it considers that such action by it would be in the interest of the public, investigate and determine whether any air carrier, foreign air carrier or ticket agent has been or is engaged in unfair or deceptive practices or unfair methods of competition in air transportation or the sale thereof. If the Board shall find, after notice and hearing, that such air carrier, foreign air carrier or ticket agent is engaged in such unfair or deceptive practices or unfair methods of competition, it shall order such air carrier, foreign air carrier or ticket agent to cease and desist from such practices or methods of competition.

POOLING AND OTHER AGREEMENTS

Filing of Agreements Required

SECTION 412 (a) Every air carrier shall file with the Board a true copy, or, if oral, a true and complete memorandum, of every contract or agreement (whether enforceable by provisions for liquidated damages, penalties, bonds, or otherwise) affecting air transportation and in force on the effective date of this section or hereafter entered into, or any modification or cancellation thereof, between such air carrier and any other air carrier, foreign air carrier, or other carrier for pooling or apportioning earnings, losses, traffic, service, or equipment, or relating to the establishment of transportation rates, fares, charges, or classifications, or for preserving and improving safety, economy, and efficiency of operation, or for controlling, regulating, preventing, or otherwise eliminating destructive, oppressive, or wasteful competition, or for regulating stops, schedules, and character of service, or for other cooperative working arrangements.

Approval by Board

(b) The Authority shall by order disapprove any such contract or agreement, whether or not previously approved by it, that it finds to be adverse to the public interest, or in violation of this Act, and shall by order approve any such contract or agreement, or any modification or cancellation thereof, that it does not find to be adverse to the public interest, or in violation of this Act;

except that the Board may not approve any contract or agreement between an air carrier not directly engaged in the operation of aircraft in air transportation and a common carrier subject to the Interstate Commerce Act, as amended, governing the compensation to be received by such common carrier for transportation services performed by it.

FORM OF CONTROL

SECTION 413 For the purposes of this title, whenever reference is made to control, it is immaterial whether such control is direct or indirect.

LEGAL RESTRAINTS

SECTION 414 Any person affected by any order made under sections 408, 409, or 412 of this Act shall be, and is hereby, relieved from the operations of the "antitrust laws," as designated in section 1 of the Act entitled "An Act to supplement existing laws against unlawful restraints and monopolies, and for other purposes," approved October 15, 1914, and of all other restraints or prohibitions made by, or imposed under, authority of law, insofar as may be necessary to enable such person to do anything authorized, approved, or required by such order.

INQUIRY INTO AIR CARRIER MANAGEMENT

SECTION 415 For the purpose of exercising and performing its powers and duties under this Act, the Board is empowered to inquire into the management of the business of any air carrier and, to the extent reasonably necessary for any such inquiry, to obtain from such carrier, and from any person controlling or controlled by, or under common control with, such air carrier, full and complete reports and other information.

CLASSIFICATION AND EXEMPTION OF CARRIERS

Classification

SECTION 416 (a) The Board may from time to time establish such just and reasonable classifications or groups of air carriers for the purposes of this title as the nature of the services performed by such air carriers shall require; and such just and reasonable rules, and regulations, pursuant to and consistent with the provisions of this title, to be observed by each such class or group, as the Board finds necessary in the public interest.

Exemptions

(b) (1) The Board, from time to time and to the extent necessary, may (except as provided in paragraph (2) of this subsection) exempt from the requirements of this title or any provision thereof, or any rule, regulation, term, condition, or limitation prescribed thereunder, any air carrier or class of air carriers, if it finds that the enforcement of this title or such provision, or such rule, regulation, term, condition, or limitation is or would be an undue burden on such air carrier or class of air carriers by reason of the limited extent of, or unusual circumstances affecting, the operations of such air carrier or class of air carriers and is not in the public interest.

(2) The Board shall not exempt any air carrier from any provision of subsection (1) of section 401 of this title, except that (A) any air carrier not engaged in scheduled air transportation, and (B), to the extent that the operations of such air carrier are conducted during daylight hours, any air carrier engaged in scheduled air transportation, may be exempted from the provisions of paragraphs (1) and (2) of such subsection if the Board finds, after notice and hearing, that, by reason of the limited extent of, or unusual circumstances affecting, the operations of any such air carrier, the enforcement of such paragraphs is or would be such an undue burden on such air carrier as to obstruct its development and prevent it from beginning or continuing operations, and that the exemption of such air carrier from such paragraphs would not adversely affect the public interest: *Provided*, That nothing in this subsection shall be deemed to authorize the Board to exempt any air carrier from any requirement of this title, or any provision thereof, or any rule, regulation, term, condition, or limitation prescribed thereunder which provides for maximum flying hours for pilots or copilots.

TITLE V—NATIONALITY AND OWNERSHIP OF AIRCRAFT

It shall be unlawful to operate or navigate any aircraft eligible for registration unless so registered by owner. An aircraft to be eligible for registration must be: (a) owned by a citizen of the United States and not registered under the laws of any foreign country; or (b) an aircraft of the Federal or other governmental agency. Such registration shall be conclusive evidence of nationality for international purposes. Authority maintains a recordation system for aircraft, engines, propellers and appliances indicating liens on same.

TITLE VI—CIVIL AERONAUTICS SAFETY REGULATION

The Board—in promotion of safety of flight in air commerce—is empowered to set minimum standards of design, performance, etc. for aircraft, engines, etc. and to make various rules and regulations regarding inspection, overhaul, reserve supply, maximum hours, traffic control, etc. calculated to promote safety.

The Administration of Civil Aeronautics is empowered to issue “airman certificates” to properly qualified applicants for specified capacities; type and production certificates for aircraft, engines and propellers after proper tests; airworthiness certificates for safe aircraft, conforming with a type certificate; and air carrier operating certificates to a properly equipped “person” found able to carry on safely a specified operation. Certificates may be amended, suspended, or revoked.

Inspectors shall be employed by the Administration to see that all air carriers’ equipment conforms to safety regulations.

Civil air navigation facilities, schools, repair stations, etc. shall be rated by the Administration of Civil Aeronautics and certificates issued to them.

TITLE VII—AIR SAFETY BOARD

Creates an Air Safety Board and details its duties. (This Board was eliminated by Reorganization Plans III and IV of 1940.)

TITLE VIII—OTHER ADMINISTRATIVE AGENCIES

Certificates for foreign, overseas, (between the U.S. and a Territory, or between two territories), or intra-Territory transportation to be subject to approval of the President of the United States.

Department of State to consult with the Board on negotiation of agreements with foreign governments for establishment or development of air navigation, including air routes and services.

Chief of Weather Bureau under Secretary of Agriculture to furnish various reports and assistance to Board and carriers.

TITLE IX—PENALTIES

Various civil and criminal penalties are provided for specified offenses under the Act.

TITLE X—PROCEDURE

Any person may appear before the Board, and any person may file with the Board a complaint it may investigate or dismiss as it sees fit. The Board is empowered at any time to institute an investigation on its own initiative.

If after notice and hearing, either upon complaint or upon its own initiative, the Board shall determine any fare or rate for interstate or overseas (not foreign) air transportation, or any rule or practice affecting such fare or rate, to be unjust and unreasonable, or unjustly discriminatory, or unduly preferential, or unduly prejudicial, the Board shall set a new lawful rate (or the maximum or minimum, or the maximum and minimum thereof) or stipulate a new rule or practice; provided that in the case of overseas air transportation the Board shall prescribe only a maximum or minimum, or maximum and minimum rate.

With respect to the determination of rates for the carriage of persons or property, the Board shall consider, among other factors:

- (1) The effect of such rates upon the movement of traffic.
- (2) The need in the public interest of adequate and efficient transportation of persons and property by air carriers at the lowest cost consistent with the furnishing of such service.
- (3) Legal standards of character and quality of air carrier service.
- (4) The inherent advantages of transportation by aircraft.
- (5) The need of each air carrier for revenue sufficient to enable the carrier, under honest, economical and efficient management, to provide adequate and efficient air carrier service.

As regards foreign air transportation, the Board may alter rates or practices concerning same when found to be unjustly discriminatory, unduly preferential, or unduly prejudicial.

The Board may suspend newly filed tariffs for a maximum of 180 days pending a hearing.

Air carriers may establish reasonable through service and joint rates, fares and charges with other common carriers; except that with respect to transportation of property, air carriers not directly engaged in the operation of aircraft

(other than companies engaged in the air express business) may not establish joint rates or charges with common carriers subject to the Interstate Commerce Act. In case of through service by air carriers and common carriers subject to the Interstate Commerce Act, it shall be the duty of the carriers to establish just and reasonable rates, etc. and show same in tariffs filed with the Interstate Commerce Commission or the Civil Aeronautics Board as the case may be.

Members or examiners of the Board may hold hearings, issue subpoenas, administer oaths, examine witnesses and receive evidence.

Orders of the Board (except any order in respect of any foreign air carrier subject to the approval of the President) are subject to review by the circuit courts of appeal of the United States or by the United States Court of Appeals for the District of Columbia. The Court may affirm, modify, or set aside the Board's order or order further proceedings by the Board.

TITLE XI—MISCELLANEOUS

Alterations of structures along airways likely to constitute hazards to air commerce must not be made without due notice to the Board.

In exercising and performing its powers the Board shall do so consistently with any obligation assumed by the United States in any treaty, convention or agreement with a foreign nation.

The Act became effective August 23, 1938.

REORGANIZATION PLAN NO. III

(April 2, 1940)

CIVIL AERONAUTICS AUTHORITY—The functions vested in the Civil Aeronautics Authority by the Civilian Pilot Training Act of 1939; the functions of aircraft registration and of safety regulation described in titles V and VI of the Civil Aeronautics Act of 1938, except the functions of prescribing safety standards, rules and regulations and of suspending and revoking certificates after hearing; the function provided for by section 1101 of the Civil Aeronautics Act of 1938; and the functions of appointing such officers and employees and of authorizing such expenditures and travel as may be necessary for the performance of all functions vested in the Administrator, are transferred from the Civil Aeronautics Authority to and shall be exercised by the Administrator, who shall hereafter be known as the Administrator of Civil Aeronautics.

REORGANIZATION PLAN NO. IV

(April 11, 1940)

DEPARTMENT OF COMMERCE—Sec. 7. Transfer of Civil Aeronautics Authority. (a) The Civil Aeronautics Authority and its functions, the Office of the Administrator of Civil Aeronautics and its functions, and the functions of the Air Safety Board are transferred to the Department of Commerce.

(b) The functions of the Air Safety Board are consolidated with the functions of the Civil Aeronautics Authority, which shall hereafter be known as the Civil Aeronautics Board and which shall, in addition to its other functions, discharge the duties heretofore vested in the Air Safety Board so as to provide for the independent investigation of aircraft accidents. The offices of the members of the Air Safety Board are abolished.

(c) The Administrator of Civil Aeronautics, whose functions shall be administered under the direction and supervision of the Secretary of Commerce, and the Civil Aeronautics Board, which shall report to Congress and the President through the Secretary of Commerce, shall constitute the Civil Aeronautics Authority within the Department of Commerce: *Provided*, That the Civil Aeronautics Board shall exercise its functions of rule-making (including the prescription of rules, regulations and standards), adjudication, and investigation independently of the Secretary of Commerce: *Provided further*, That the budgeting, accounting, personnel, procurement, and related routine management functions of the Civil Aeronautics Board shall be performed under the direction and supervision of the Secretary of Commerce through such facilities as he shall designate or establish.

Appendix

B * CHANGES PROPOSED IN THE CIVIL AERONAUTICS ACT ¹

(Senate Bill 2647, introduced January 11, 1954, 83rd Cong.,
2nd Sess.)

TITLE I—GENERAL PROVISIONS

DEFINITIONS

SECTION 101 (2) Defines “regular” and irregular air carriers” for the first time: A regular air carrier, as one “which conducts its service so as to serve traffic between the same two or more points either according to a published timetable or with flights so regular or frequent that they constitute a recognizably systematic service”; and an irregular carrier as any “other than a regular air carrier.”

It puts air freight forwarders in the air carrier category, making no distinctions as to indirect operations.

(7) Exempts employes of certificated repair stations and aircraft manufacturers from the requirement that they be certificated with “airman” status.

(24) Expands “interstate air commerce” to include operations to any territory or possession and operations between points in the same state, routing through other states. The “overseas” category is eliminated, leaving only two categories of air commerce, “foreign” and “interstate.”

DECLARATION OF POLICY

SECTION 102 (A) Adds a new aim of national aviation policy: “The public interest in the furtherance of national policy.” It retains the aims of aviation development in the interests of commerce, the postal service and national defense.

(B) Adds the factor of “free enterprise” to those to be taken into account in the regulation of air commerce.

(G) Sets forth a “state’s rights” declaration, giving states jurisdiction over wholly intrastate operations.

¹ This bill was the subject of extensive hearings but was not voted out of the Senate Committee on Interstate and Foreign Commerce during the 2nd Session of the 83rd Congress. In all probability the same or a similar bill will be introduced early in the 84th Congress and it will be a subject of discussion at that time.

(H) Adds a new policy of "the maintenance by the U.S. of the greatest possible influence at all times in world aviation."

PUBLIC RIGHTS OF TRANSIT

SECTION 103 (B) Spells out for the first time the right of private fliers to operations in the U.S. airspace.

TITLE II—CIVIL AERONAUTICS AUTHORITY

SECTION 201 Establishes a seven-member civil aeronautics authority, appointed by the President and confirmed by the Senate; limits to four the members from any political party; sets a \$17,500 a year salary for members.

SECTION 202 Establishes an "officer" appointed by the authority at \$17,000 a year.

SECTION 204 Provides for the authority to assist the states in development of civil aeronautics.

SECTION 212 Directs the authority to formulate and implement a national program for protection of aerial approaches to airports.

SECTION 213 Incorporates provisions of the 1946 Airport Development Act.

TITLE III—AIR CARRIER ECONOMIC REGULATION

CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY REQUIRED

SECTION 301 (A) Requires all air carriers—irregular and regular—to obtain certificates.

(D) Encourages the authority to initiate investigations for new transportation and, if found needed, to invite applicants.

(E) Authorizes the issuance of "experimental" certificates which would not require a showing of "public necessity," provided the service would not substantially duplicate existing service. Mail compensation could not exceed 20% of the "reasonable cost" of performing the service.

(F) Authorizes certificates governing "area" service, without specifying points to be served.

(H) (3) Authorizes the authority to require extensions of domestic service after hearings.

PERMITS TO FOREIGN AIR CARRIERS REQUIRED

SECTION 302 (A) Bans foreign air carriers from engaging in interstate air commerce or interstate air transportation.

(B) Provides that foreign operations into the U.S. must be covered by agreement between the U.S. and the country concerned.

(d) Provides that hearings are to be held on applications of foreign carriers to operate into the U.S. if requested within a specified time.

RATES FOR TRANSPORTATION OF MAIL

SECTION 306 (A) Removes the requirement for separation of airmail pay and subsidy, restating the 1938 act.

INTERLOCKING RELATIONSHIP

SECTION 309 (A) Adds underwriters and air contract carriers to the parties between whom relationships are prohibited without approval of the authority.

(D) Gives the authority powers over the issuance of securities by air carriers.

POOLING AND OTHER AGREEMENTS

SECTION 312 (A) Lessens the requirement for filing agreements, authorizing the authority to stipulate agreements to be filed.

(B) Provides that no order disapproving an agreement may be issued without hearings.

EXEMPTION OF CARRIERS

SECTION 316 (B) (2) Limits exemptions from the requirement for a certificate to air transportation involving planes with a gross takeoff weight of 12,500 lbs. or less, or air transportation temporarily supplementing certificated service.

TITLE IV—AIR CONTRACTOR ECONOMIC REGULATION

(Note: This entire title is new. Under present law contractors are not subject to economic regulation. There is a difference of legal opinion as to whether owners of corporate aircraft fall into this category.)

SECTION 401 Requires all air contractors to obtain licenses and spells out a procedure similar to the procedure for obtaining a certificate.

SECTION 402 Authorizes the authority to exempt contractors from economic regulation to avoid "undue or unwarranted burdens" if this is considered in the "public interest."

TITLE V—NATIONALITY AND OWNERSHIP IN AIRCRAFT

(This title makes no significant changes in existing law.)

TITLE VI—CIVIL AERONAUTICS SAFETY REGULATION

SECTION 601 Directs the authority to promote safety of flight in "air navigation" and "protect persons and property on the ground from hazards resulting from air navigation." Present law is not as inclusive, mentioning only "safety of flight in air commerce."

TITLE VII—AIR SAFETY BOARD

SECTION 701 Establishes an air safety board of five members, appointed by the President and confirmed by the Senate, and sets terms of six years and salaries of \$9,000 a year for members. It stipulates that at least one member must be an airline pilot with 3,000 hours scheduled flying time and that at least one member must be a licensed private flier.

SECTION 704 (1) Gives the board discretion as to which accidents to in-

investigate and requires it to report to the authority on facts and probable cause of an accident "to the extent ascertained." Present law requires investigation of all accidents and conclusions, regardless of how scanty the evidence.

(3) Gives the board discretion on making its accident findings and recommendations public.

(5) Imposes the new duty on the board of making and publishing "technical studies."

SECTION 706 Bans use of "any record" of the board in suits or actions for damages.

SECTION 790 Requires an annual report by the Board to Congress.

TITLE VIII—OTHER GOVERNMENTAL AUTHORITIES

SECTION 801 (A) Requires Presidential approval of licenses to air contractors as well as certificates to air carriers for operations outside the continental U.S.

(B) Requires that all international air agreements take the form of treaties, subject to Senate confirmation.

SECTION 803 Directs the Weather Bureau to make recommendations to National Advisory Committee for Aeronautics on research projects to promote civil aviation.

SECTION 804 Directs the authority to recommend projects to NACA.

TITLE IX—PENALTIES

CIVIL

SECTION 901 (A) Imposes civil penalties for violations of "any requirement of any order, rule, regulation, or certificate" issued under the statute, as well as for violations under the statute itself. Present law provides only for statute violations.

CRIMINAL

SECTION 902 (A) Raises the maximum fine for economic violations from \$500 to \$2,000 for the first offense, places no maximum for subsequent offenses, and eliminates "ticket agent" in the listing of those liable to penalty for granting rebates.

(F) Strikes out the 1938 act's provision for fines for neglect or refusal to testify.

TITLE X—PROCEDURE

SECTION 1001 (A) Gives the authority broad power to delegate functions either to members of the authority or employees.

(D) Gives the authority power to prescribe rates for foreign, as well as domestic, air transportation, and also authority to prescribe rates for air contractors in both domestic and foreign operations.

(E) Adds to the factors to be considered in rate making: "The right of every person within the limits of fair competition . . . to risk his capital or

forego possible profits in an endeavor to build his business or . . . expand a new venture.”

(I) Extends the power of the authority to establish through-service and joint rates to foreign air carriers as well as to U.S. carriers.

SECTION 1007 Gives the courts jurisdiction to enforce violations of air contractor licenses and foreign air carriers certificates, retaining provision for court jurisdiction over U.S. air carrier certificates.

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